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ABSTRACT

The accountability movement has forced educators to expend energys during the past few years ensuring that students master a developmental sequence of skills in the major content areas. In mathematics this has resulted in an emphasis upon computational proficiency, and, in the view of many mathematics educators, not enough time has been spent on problem-solving skills. This material was designed to be a systematic approach to curriculum enrichment so that much of the work can be handled by someone other than a classroom teacher, freeing the teacher to work with students on problem solving, creative thinking, and critical thinking. Superstars II is offered as an opportunity for self-motivated students who choose to become involved in the program. The program is managed by an adult (volunteer, aide, etc.) and focuses on the acquisition of the "skills for excellence" identified for Florida schools. This document includes: (1) a description of the Superstars program; (2) student worksheets for grades one, two, and three; and (3) teacher commentary for the student worksheets, including the skills of excellence for third grade. (TW)

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SUPERSTARS II, Primary

A STANDARDS OF EXCELLENCE CURRICULUM PROJECT FOR PRIMARY-LEVEL STUDENTS

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ACKNOWLEDGEMENTS

This project was conceived of, coordinated by, and supported financially through the Florida Department of Education (DOE). Student materials were developed, field tested, and reviewed by a large number of Florida's district teachers, principals, supervisors and DOE consultants.

Many of the problems in SUPERSTARS II are adaptations of problems from the National Council of Teachers of Mathematics (NCTM) publications, Long Island Mathematical Olympiads for Elementary Schools (LIMOS), and Brevard County's Project Magic. We gratefully acknowledge these contributions.

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Single or multiple copies may be requested from the Public School Resource Center, Florida Department of Education, Knott Building, Tallahassee, FL, 32301. Inquiries regarding the appropriate use of the package should be addressed to Dr. Andy Reeves, Elementary Mathematics Consultant, Florida Department of Education.

MATH
SUPER ST
GRADES
4
5
FLORIDA
TRAFFIC
STOPPER

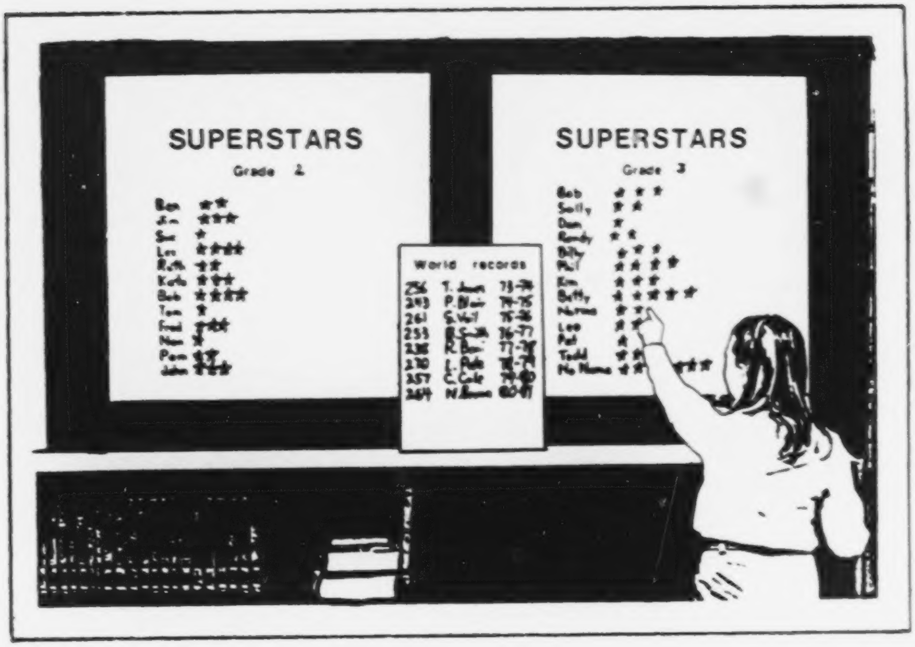
PREFACE

Providing appropriate educational experiences for the entire spectrum of students found in most elementary classrooms is a very real problem. Accountability has forced educators to expend most of their energies during the past few years ensuring that students master a developmental sequence of skills in the major content areas. Society has generally interpreted such sequences in elementary mathematics as leading primarily to computational proficiency. One consequence of this emphasis is that not as much time is available for activities that develop basic problem-solving skills that go beyond the minimal, nor for enrichment experiences that expand a student's creative tendencies.

In 1984, Florida's State Board of Education adopted "Standards of Excellence" as benchmark indicators of what able students in quality programs should strive for in mathematics. These skills are written for students who have completed the 3rd, 5th, 8th, and 12th grades. Those skills that pertain to the elementary grades are listed in the first few pages of the Teacher Commentary section of this package. This material is intended to provide a supplementary program to help students learn and practice these "skills of excellence" over a five- year period.

This material uses a systematic approach to curriculum enrichment that is designed so that much of the work can be handled by someone other than a classroom teacher, freeing the teacher for the part that he or she does best--helping students learn how to think critically and creatively. The system is not meant to replace any aspect of the normal school curriculum--it is offered as a peripheral opportunity to self-motivated students who identify with challenges, who want to do more in school than we ask of them, and who enjoy being rewarded for their extra efforts. Since progress toward "excellence" requires a commitment on the student's part, participation in SUPERSTARS should be optional--only those students who choose to become involved will be successful in the program, over a full academic year. Any student, regardless of prior achievement in mathematics, should be allowed to participate as long as they remain interested in the program.

We believe that our schools will respond to this program by recruiting several dedicated adults who can spend the few hours each week making the system operate effectively in a school. We believe that Florida's teachers will welcome this supplementary program intended to enhance their daily efforts to get children to use higher-level thought processes. And finally, we believe that Florida's elementary students will far surpass our initial expectations in demonstrating "excellence" in elementary mathematics.


SUPERSTARS
Grade 2
SUPERSTARS
Grade 3
Bob
Sally
Dan
Randy
Billy
Phil
Kim
Betty
Norma
Lee
Pat
Todd
No Name
World records

ORGANIZATION OF THESE MATERIALS

Section 1 ... Description of the SUPERSTARS II program

1) General information
2) Information/checklist for principals
3) Information/checklist for assisting adults
4) Information for teachers
5) Letter to participating students and their parents

Section 2 ... Student worksheets

1) For grade 1, numbers I through XXV
2) For grade 2, numbers I through XXV
3) For grade 3, numbers I through XXV

Section 3 ... Teacher Commentary for student worksheets

1) Skills of Excellence for 3rd grade, end-of-year
2) Teacher Commentary for grade 1, worksheets I through XXV
3) Teacher Commentary for grade 2, worksheets I through XXV
4) Teacher Commentary for grade 3, worksheets I through XXV

SUPERSTARS II: GENERAL INFORMATION

SUPERSTARS II is a program designed to be managed by an assisting adult (volunteer, aide, etc.) and supported by school administrators and classroom teachers. Each has a key role to play in the success of the program. Instructions for each role are described in the succeeding pages.

Students choose on their own to participate in SUPERSTARS II. A weekly cycle is established early in the school year, and follows this format:

> On Monday of each week, student worksheets are distributed by the assisting adult to those in the program. Students have until Friday to complete the problems, working entirely on their own. On Friday, the classroom teacher hosts a brief problem-solving session for the students in the program, discussing the more difficult problems on the worksheet for that week.
>
> Students get double-credit for those problems they completed correctly prior to the problem-solving session, and regular credit for those they complete over the week-end. On Monday all papers are handed in, checked by the assisting adult, and stars posted as a reward for working individual problems. This completes the cycle for the preceding week, allows for the new worksheets to be passed out, and the cycle begins again.
>
> The use of calculators is permissable.

The visual reinforcement of seeing their names displayed in a prominent place in the school, with a string of stars indicating their success, is the basic reward a student receives for the extra work. Some competition will naturally emerge among the students who accumulate a good many stars, but the system does not rely on this competition for its success. Some students will continue in the program week after week, even though they are earning only a few stars. This is particularly evident when schools enhance the basic reward system by awarding varying prizes for attaining different levels of success.

SUPERSTARS II is not a program for every child--it's only for those who are self-motivated and who are not frustrated by challenging situations. This does not diminish the value of the program, but rather makes us realize that "excellence in elementary mathematics" requires something special on the part of the child. Those children who complete the SUPERSTARS program are in the process of becoming excellent mathematics students.

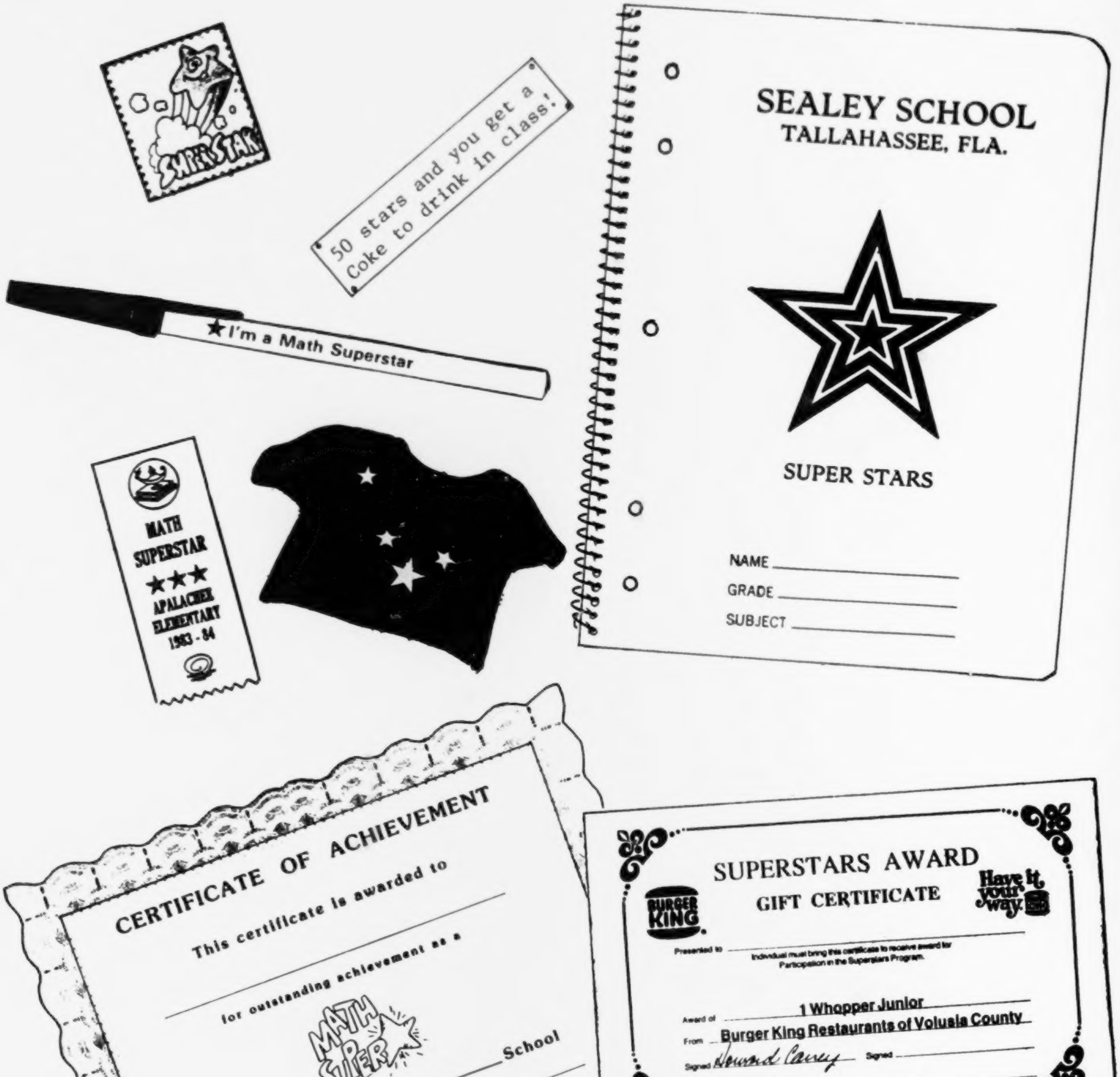
SUPERSTARS II: INFORMATION FOR PRINCIPALS

SUPERSTARS II is a curriculum enrichment package designed to be managed by volunteer assisting adults, with coordinated teaching by the classroom instructor. The purpose of the program is to help students learn the "skills of excellence" identified for Florida schools, in the subject area of mathematics. The complete set of material comes in two packages, one for grades 1, 2, and 3, and the other for grades 4 and 5. Worksheets from the original SUPERSTARS package can be used for students in grade 6.

As an administrator, you need to:

- become thoroughly familiar with the program;
- duplicate for each teacher a copy of the worksheets and teacher commentary for that grade level, and then introduce the program at a faculty meeting early in the year;
- speak to parents at your school's first "open house" of the year, explaining the purpose of the program and the long-term value of their child working independently on the worksheets; and
- recruit or assign several assisting adults (volunteers, aides, etc.) who are enthusiastic, dependable people to manage the program. Early in the year, meet with the assisting adults to plan the following details:
    1. A prominent place and format for the STAR CHART.
    2. A place and time each Monday for the assisting adult to be in the school.
    3. A system for the activity sheets to be duplicated each week. They must be clear and legible.
    4. A plan for extra incentives for accumulating stars. ("World records" to be kept from year-to-year, or a "brain bowl" planned for the end of school. Can students earn SUPERSTAR prizes for attaining certain levels of success? See the reverse side of this page for examples.)
    5. A schedule for when the program will start. Will there be opportunities later in the year for others to start? Will a new chart be started at the beginning of each quarter or each succeeding grading period? (Review a school calendar, and work backwards from the end of the year, using only weeks that have at least 4 school days. You'll need 25 weeks for the primary program, and 28 for the intermediate program).
- monitor the program every two weeks to clear up any unforeseen problems. Administrators need to be highly visible.

SUPERSTARS is an optional program for students. It should be available to any student who wants to try it, regardless of prior success in mathematics. You should expect to see a large group of students begin the program, but a majority of them will lose interest. The small group that stays involved with SUPERSTARS over the full academic year are self-motivated students with good study habits, the sort most likely to become "excellent" students.


SUPERSTAR
50 stars and you get a Coke to drink in class!
★I'm a Math Superstar
MATH SUPERSTAR ★★★ APALACHEE ELEMENTARY 1983-84
SEALEY SCHOOL
TALLAHASSEE, FLA.
SUPER STARS
NAME
GRADE
SUBJECT
MATH SUPER★

CERTIFICATE OF ACHIEVEMENT

This certificate is awarded to

for outstanding achievement as a

School

Principal

at

Date

SUPERSTARS AWARD

GIFT CERTIFICATE

Presented to

Individual must bring this certificate to receive award for Participation in the Superstars Program.

Award of 1 Whopper Junior

From Burger King Restaurants of Volusia County

Signed Howard Carey Signed

Limit one per customer. Expires 12-31-85 Dated

SUPERSTARS II: INFORMATION FOR ASSISTING ADULTS

SUPERSTARS II is designed to be managed by assisting adults and supported by teachers, administrators, and parents. The success of the program will depend on this team effort. Reliability and punctuality are important--students will rapidly learn to depend on the assisting adult being there each week, checking their papers, and posting their stars. If possible, wear an outfit that fits in with the SUPERSTARS logo; students will quickly begin to identify you as an important person in their school.

SUPERSTARS II works on a weekly cycle. Each Monday, you collect the worksheet from the previous week and distribute new worksheets to the participating students from your SUPERSTARS area in the school. You then check the worksheet from the previous week and post the stars earned on the STAR CHART.

Students have from Monday until Friday to work the problems entirely on their own--the only help they can receive is to have someone read the problems to them. On Friday, the teacher will host a problem-solving session in the classroom, discussing how to approach the more difficult problems. Students who have already worked the problems (prior to the problem-solving session) can earn double the number of stars--you can tell these by looking for the teacher's initials beside certain problems. The students will have from Friday until Monday to re-do those problems they did not understand--for these problems, they earn the indicated number of stars if they are correct.

There are a number of creative ways to format the STAR CHART. The basic method of posting stars one at a time will probably eventually yield to a color-coded system, or one that involves posting only 1 star per week, with a number inside it. Try to personalize the chart and the entire SUPERSTARS areas with pictures of the students, "smiling faces," etc. Be creative--your efforts will be rewarded by seeing enthusiastic students making progress toward mastering high-level thinking skills.

As an assisting adult, you will need to:

Plan with the principal the following:

1. A prominent place and format for the STAR CHART,
2. the time and place each Monday for you to take up and check papers and distribute new worksheets,
3. the system for duplicating each week's worksheets, ensuring legible copies, and
4. which, if any, extra incentives ("world records," stickers, coupons, pencils, tee shirts, etc.) will be part of the system for rewarding various levels of achievement in SUPERSTARS II.

Make the SUPERSTARS spot a happy place with bright colors, smiles, and cheerful words. Show confidence, friendliness, and encouragement to students.

Collect the letters, signed by the student and parent, which is sent home prior to the first activity sheet. If at any time you have good evidence that a student is getting help on the problems, mention it to the classroom teacher.

Check the worksheet from the previous week consistently. If you decide to give partial credit for a problem with several parts, award the stars consistently and be firm, but fair, in explaining this to students who question it. Do not give partial credit for problems with only one answer.

Allow students to see the answers to problems when they hand in a worksheet and to defend an answer that is different from the given answer. If they used clear logic in arriving at a unique answer, give them full credit.

Leave extra worksheets with the classroom teacher for students who were absent on Monday. Allow a worksheet to be turned in late only if the student was absent on Monday. If a worksheet does not have a student's name in the proper place, check the paper but award the stars to "No name" on the STAR CHART. Adhering strictly to these rules will teach responsibility to the students, and keep your work load manageable.

Keep all returned worksheets. Do not give them back to the student, since the same worksheets are used year-after-year.

On the Mondays when SUPERSTARS II will not be available (perhaps a vacation shortens the week too much), post a sign such as "No star problems this week, but come back next week, please!"

SUPERSTARS II: INFORMATION FOR TEACHERS

SUPERSTARS II is designed to help you teach the mathematics Skills of Excellence adopted by Florida's State Board of Education in 1984. It is intended to complement, not replace, your normal curriculum by offering peripheral opportunities to self-motivated students who frequently exceed normal expectations.

The program is designed so that your involvement is strictly as a teacher. SUPERSTARS II will remain "special" to students if it's managed by someone outside the classroom setting, and if the teacher is viewed as a "helper" in the system, rather than as a dominant figure. Your primary role is to monitor the system in your own classroom and host a problem-solving session for SUPERSTARS students on Friday of each week.

A TEACHER COMMENTARY page accompanies each worksheet, and will tell you which Skill of Excellence is addressed by each problem. The Commentary will also give you hints on how to cover the problems in your problem-solving session, without actually giving away the answers. Even though there is a comment for each problem, you will have to decide which 3 or 4 problems you will cover during this brief session. Concentrate on those that require higher-level thinking!

Do not be disappointed if a large number of students in your class begin SUPERSTARS, but some of them drop out after a few weeks. This is a natural phenomenon; problem-solving requires a great deal from students, and only certain ones are ready to accept this sort of challenge. You will notice that certain students do choose to stay in SUPERSTARS week-after-week, even though they aren't as successful in earning stars as other students.

Please read the General Information in the SUPERSTARS package, to get an overview of the program. The back of this page contains some "helpful hints" that you might find useful in your work with SUPERSTARS II. The use of calculators is permissable. And finally, look over the first few student worksheets for your grade level so that in the weeks before the program starts in your school, you can review in class any terminology or symbolism that might be confusing to students.

SPECIAL NOTE FOR KINDERGARTEN TEACHERS: Because of a reluctance to design a paper-and-pencil-dependent system for such young students, SUPERSTARS II does not include student materials for your students. Many of them will be ready for the type of activities we have at the beginning of the first grade material, however, by the end of your year with them. We encourage you to look at the first grade worksheets, and begin incorporating such problem experiences, at a concrete level, into your kindergarten curriculum toward the end of the year.

Please keep these points in mind this year regarding SUPERSTARS II:

Allow your students to leave the classroom at the designated time on Monday morning to turn in their worksheets and pick up new ones. The "assisting adult" will take a few extra minutes, and read the new worksheet to students in the primary grades.

Read each week's worksheet yourself, and feel free to structure classroom activities that parallel those on the SUPERSTARS worksheets. However, please do not "teach to the worksheets."

During the school week, students can work on SUPERSTARS during their spare time, but the only help they can receive is for some adult to read the problems to them. Give them one warning if you see them discussing the worksheets, and take away their papers for the next violation.

Host a brief problem-solving session for SUPERSTAR participants on Friday. Remember these points:

> Students come to this session with their worksheets, but without pencils.
>
> The session must be brief--15 minutes at most. Discuss only the 3 or 4 more difficult problems on the sheet.
>
> Do not give answers to the problems. Rather, concentrate on approaches to the problems.
>
> Help students summarize their own approaches to the problems, in a non-judgemental fashion. Offer your own approach last, and only when it's different from the student strategies.
>
> End the session by encouraging students to complete the problems they haven't done, over the week-end. Put your initials beside any problem discussed in class which a student has already done, if the answer is correct. The assisting adult will award "double stars" for these.

Remember that part of the SUPERSTARS program is to teach responsibility. Students will rapidly learn to follow whatever rules structure a program, if the program is important to them. SUPERSTARS becomes very important to certain students, so they will adhere to rules about where their name goes on each paper, no credit if they forget their worksheet on Monday, no talking about the problems, etc., if you enforce the rules.

Enjoy SUPERSTARS. Students will impress you with their ability to think, and their creative ways to solve problems that seem to be above their level.

SUPERSTARS II: INFORMATION FOR STUDENTS

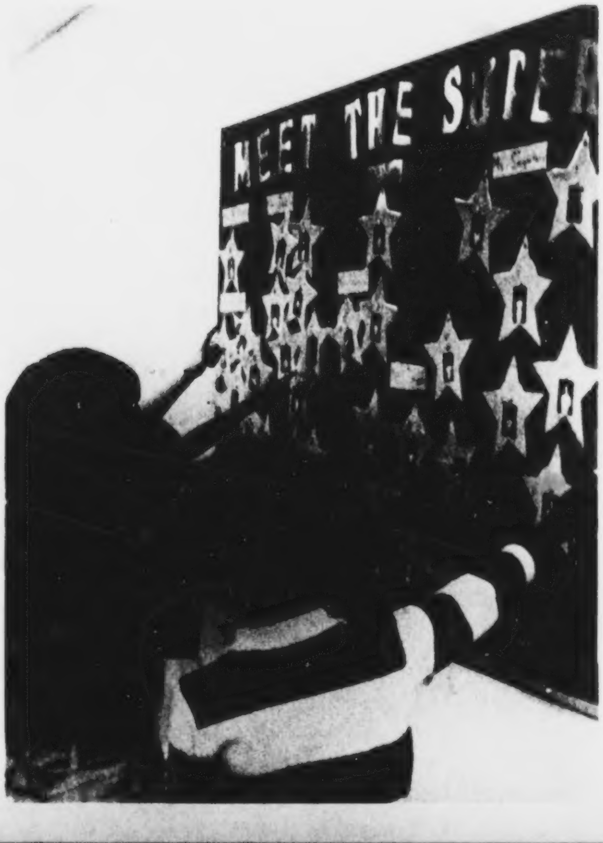
SUPERSTARS II is for kids who enjoy extra work, with very little pay! All you might get for this extra work are some stars on a chart. But at least your friends and parents will know that you're a SUPERSTAR, because your stars will be placed in the school where everybody can see them.

You can get a worksheet full of problems each Monday, and you'll have until Friday to do them in your spare time. Your classroom teacher will show you how to begin the harder problems on Friday, if you haven't already finished them. You can do those problems over the week-end, but on Monday you have to turn in the worksheet to get your stars. If you forget to turn in the paper, or to put your name on the paper in the right place, *you won't get your stars*!

You don't have to take a worksheet every week--if you get tired or want a vacation, you can skip a week. You also don't have to do every problem on each sheet. All worksheets should be turned in on Monday, even if only one problem is completed. Those completed by Friday earn *double* credit.

There is one big rule -- you can't talk about the problems with anyone until you have turned in the worksheet. (Your teacher and parents will know about this rule, too, and remind you.) An adult can read any problem out loud to you if you can't read it yourself. When you sign your name on the worksheet and turn it in, you are saying that you didn't receive any help or give any help to other students.

If you have read this letter and want to become a part of SUPERSTARS, sign below. Have your parents read the other side of this sheet and sign it also. Then turn this page in before you receive your first worksheet.



____
Your signature

SUPERSTARS II: INFORMATION FOR PARENTS

Your child has indicated an interest in starting the SUPERSTARS II mathematics enrichment program. The purpose of the program is to help students become "excellent" students of mathematics, over a several-year time period.

Most of SUPERSTARS II is problem solving. Your child will be given a worksheet full of problems on Monday, and have until Friday to solve them completely on his/her own. You can read the problems to your child if he/she is having difficulty with the words, but that is the only help you can give. On Friday, the teacher will discuss how to approach the more difficult problems. Your child will then have the week-end to re-do the harder problems before turning the worksheet in on Monday. The advantage to doing the problems by Friday is that the child receives double credit for doing them prior to getting help.

How can you help your child be successful with SUPERSTARS? Perhaps the best way is to establish a work schedule that allows enough time each week to think about the problems prior to Thursday night. A schedule like the one below often helps:

Monday night:	The child reads all the problems, to understand the problem situations.
Tuesday night:	The child reads all the problems again, and does the easy ones.
Wednesday night:	The child reads the remaining problems again, and tries one or two harder ones.
Thursday night:	The child finishes the worksheet, doing as much as he/she can.

Help your child understand that he/she will rarely be able to do all the problems on a worksheet prior to the Friday "help session." But learning how to approach the harder problems will pay off in the end, since he/she will see problems like them in the future.

SUPERSTARS II is entirely optional for students. When the "lure" of participating in a new program begins to wear off and students realize how difficult some of the problems are, some will lose interest and drop out. This is a natural phenomenon and reflects that SUPERSTARS is for self-motivated students with good work habits. If your child decides to discontinue SUPERSTARS, allow him/her to do so in a non-judgemental fashion--perhaps they'll pick it up again later on their own, when they're ready for this type of experience. As long as he/she is participating in SUPERSTARS, remain interested in their progress but not "pushy" about the program.

If you agree for your child to begin SUPERSTARS II, sign below:

____
Parent's signature

WORKSHEETS
FOR
GRADE 1

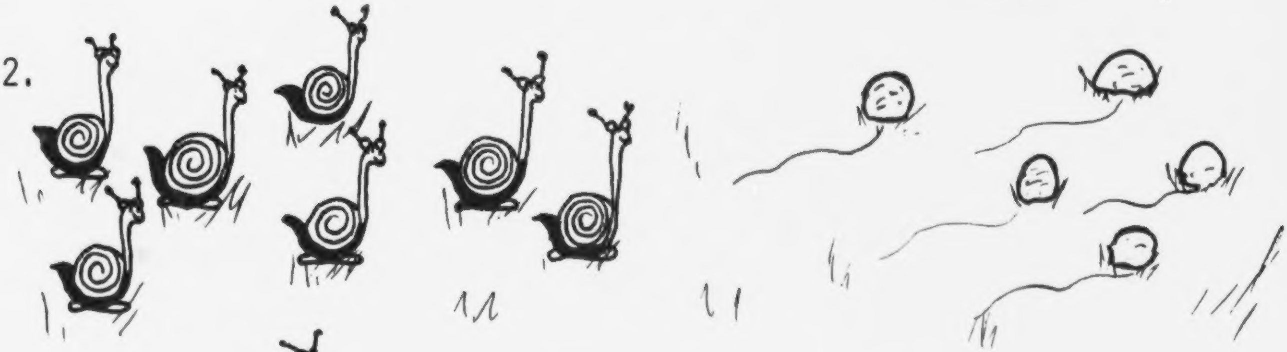
STAR PROBLEMS
GRADE 1, I

I DID THIS WORK MYSELF: ______________

★ 1. FIVE LITTLE 🦇'S FLYING HIGH.
SIX MORE COME TO SIT NEARBY.
HOW MANY 🦇'S IN ALL?

ANSWER: ________ 🦇'S IN ALL.

★ 2.



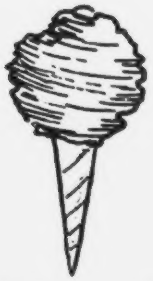
HOW MANY 🐌'S DO NOT HAVE A ROCK? ANSWER: ____

★★ 3. ANN CAN EARN 10¢ A DAY FOR DOING GOOD WORK. HOW MUCH MONEY DID SHE GET THIS WEEK?

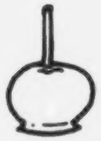
	S	M	T	W	TH	F	S
ANN	☺	X	☺	☺	☺	☺	X

ANSWER: ANN EARNED __________ THIS WEEK.

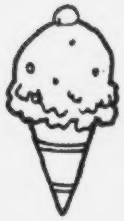
★★4. ABOUT HOW TALL IS EACH PICTURE?



ABOUT ____CM

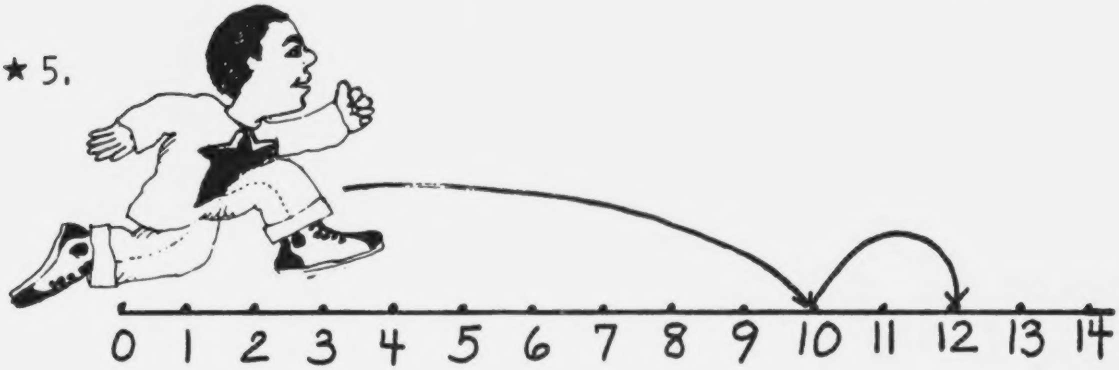


ABOUT ____CM



ABOUT ____CM

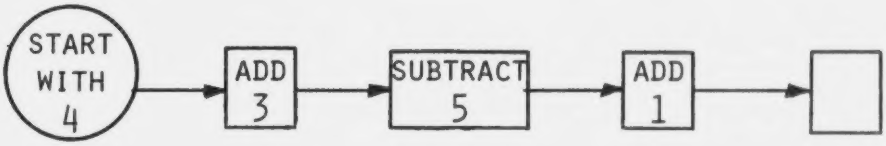
★5.


0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

WRITE A NUMBER SENTENCE TO SHOW HOW FAR THE BOY JUMPED.

ANSWER: ____________________

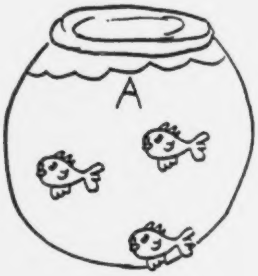
★★ 6. ADD OR SUBTRACT FOR EACH STEP IN THIS FLOWCHART. WRITE YOUR ANSWER IN THE FINAL BOX.

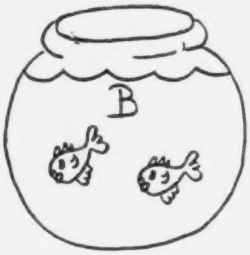

START WITH 4
ADD 3
SUBTRACT 5
ADD 1

STAR PROBLEMS
GRADE 1, II

I DID THIS WORK MYSELF: __________

★★★★1. HOW MANY WAYS CAN YOU PUT 5 FISH IN 2 BOWLS?

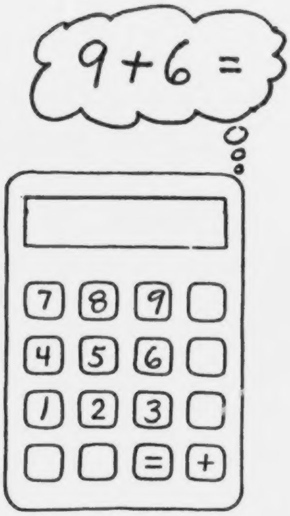


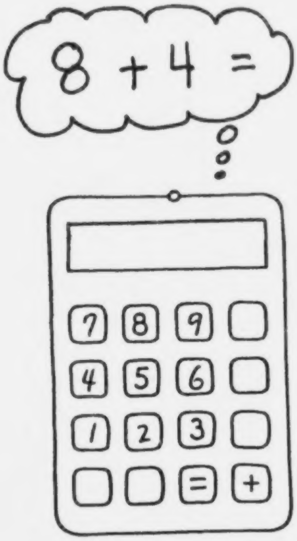


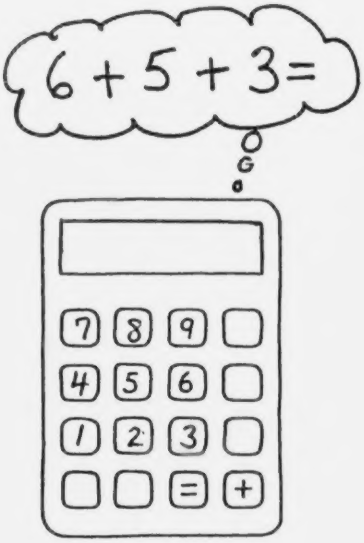
MAKE A TABLE TO SHOW ALL THE WAYS.

A			3			
B			2			

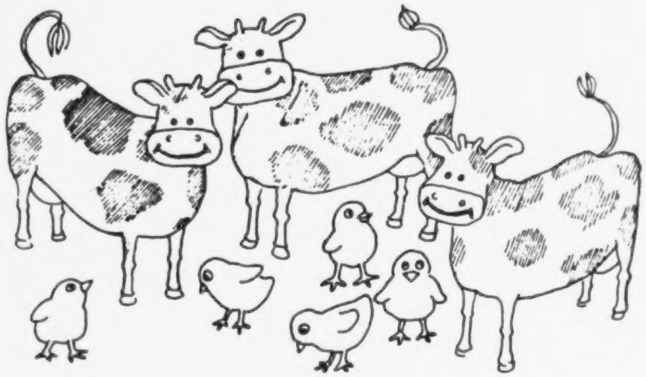
★★★ 2. USE A TO DO EACH PROBLEM BELOW. WRITE YOUR ANSWER IN THE RIGHT PLACE FOR AN ANSWER ON A .


9 + 6 =
7 8 9
4 5 6
1 2 3
= +


8 + 4 =
7 8 9
4 5 6
1 2 3
= +


6 + 5 + 3 =
7 8 9
4 5 6
1 2 3
= +

★★★ 3.

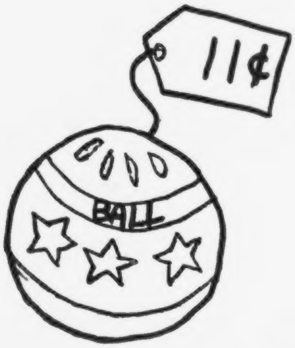


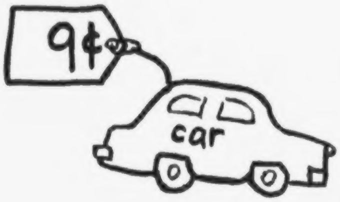
(A) HOW MANY LEGS ON 4 COWS? _____

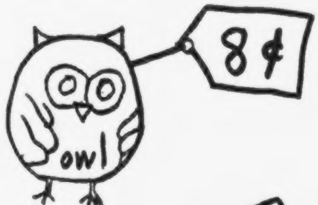
(B) HOW MANY LEGS ON 7 CHICKS? _____

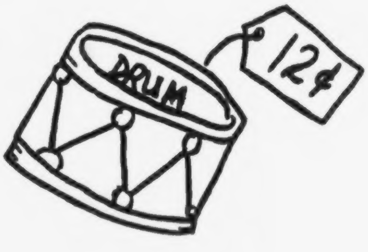
(C) HOW MANY LEGS ON 2 COWS AND 3 CHICKS TOGETHER? _____

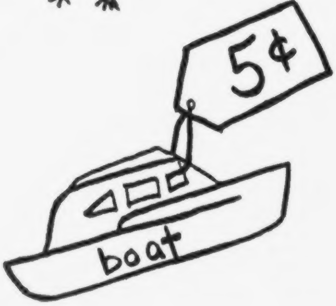
★★★★ 4. BOB SPENT 26 CENTS ON 3 TOYS. CIRCLE THE TOYS.









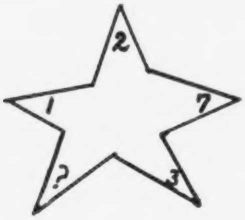


STAR PROBLEMS
GRADE 1, III

I DID THIS WORK MYSELF: ________

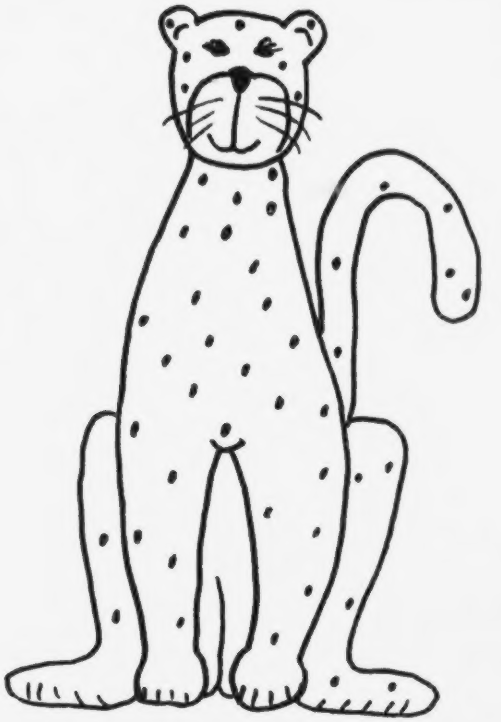
★★★ 1. O. K., SUPERSTAR, WHAT NUMBER IS MISSING ON THE STAR SO THAT THE SUM IS 17?

ANSWER: ____

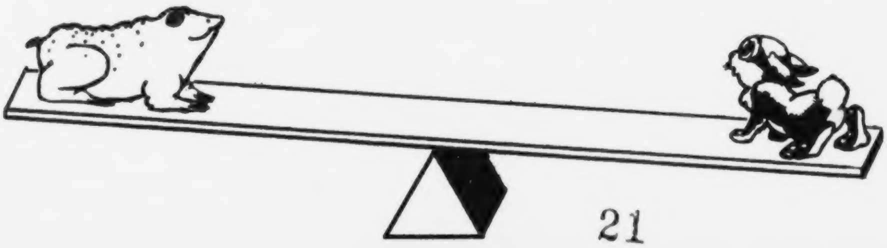


★★ 2. YOU ARE THE NEW ZOO KEEPER. YOUR FIRST JOB IS TO COUNT THE DOTS ON SPOT. HOW MANY DOTS ARE THERE?

ANSWER: ____



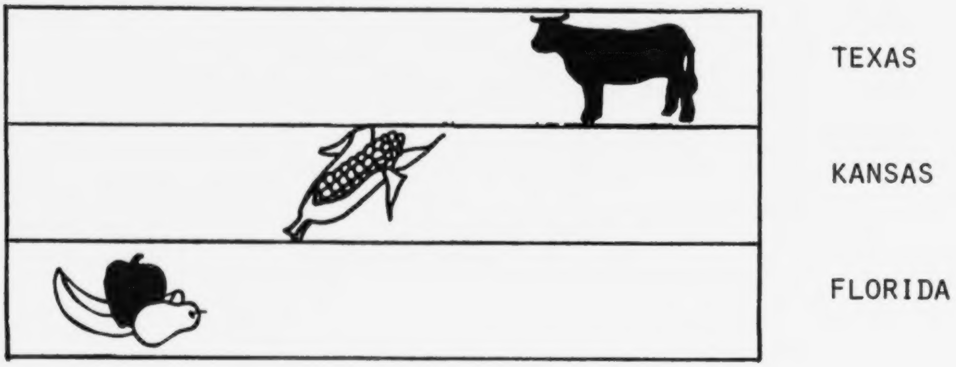
★ 3. WHICH ANIMAL IS HEAVIER? COLOR THAT ANIMAL.



★ 4. WHICH STATE GROWS FRUIT?

ANSWER____________

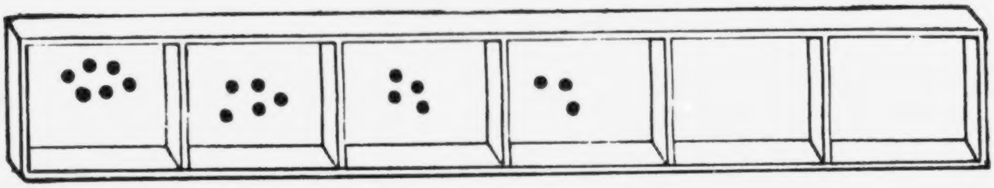
STATE YOUR CLAIM!



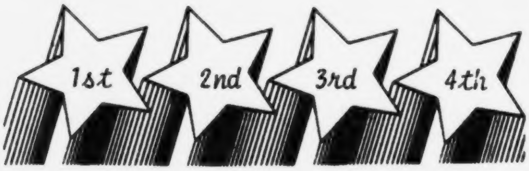
★★★★ 5. JAN WATCHES SESAME STREET FOR 1 HOUR AND CARTOONS FOR 2 HOURS EACH SCHOOL DAY. HOW MANY HOURS DOES SHE SPEND WATCHING THESE PROGRAMS EACH WEEK?

ANSWER: ___ HOURS

★★ 6. FIND THE PATTERN AND FILL IN THE EMPTY BOXES.



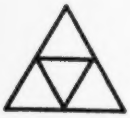
★ 7. CONGRATULATIONS! YOU ARE A STAR! YOU ARE NOT THE LAST STAR. YOU ARE NOT THE SECOND STAR BUT YOU ARE TO THE LEFT OF THE SECOND STAR. COLOR THE STAR THAT YOU ARE.



STAR PROBLEMS
GRADE 1, IV

I DID THIS WORK MYSELF: ____________

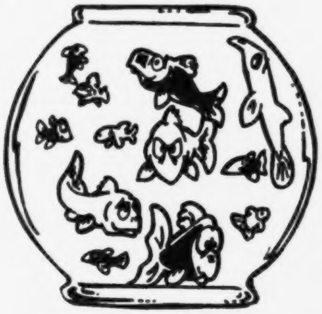
** 1. HOW MANY TRIANGLES CAN YOU FIND IN THE PICTURE TO THE RIGHT?

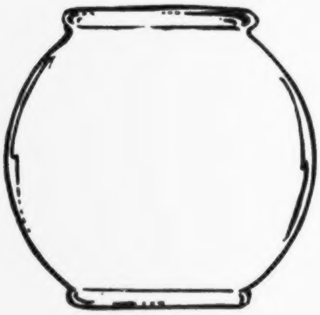


ANSWER: __ TRIANGLES

*** 2. THERE ARE TOO MANY FISH IN THE FISH BOWL. TAKE ENOUGH OF THEM OUT AND PUT THEM IN THE OTHER BOWL SO YOU WILL HAVE THE EXACT SAME NUMBER IN BOTH BOWLS. HOW MANY DO YOU HAVE TO MOVE?

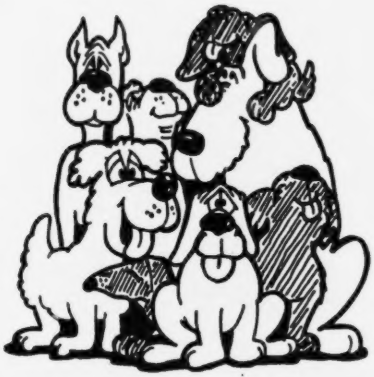
ANSWER: ____





**** 3. HOW MANY EARS ARE THERE IN THIS GROUP OF DOGS?

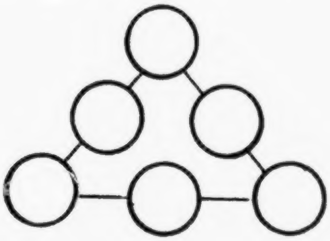
ANSWER: ____



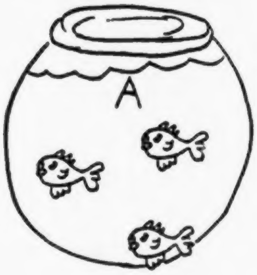
HOW MANY LEGS ARE THERE IN THIS GROUP OF DOGS?

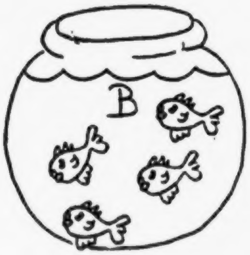
ANSWER: ____

★★★★ 4. PLACE THE NUMBERS 1, 2, 3, 4, 5, AND 6 IN THE CIRCLES SO THAT THE SUM ALONG EACH SIDE IS 10.



★★★ 5. HOW MANY WAYS CAN YOU PUT 7 FISH IN 2 BOWLS?





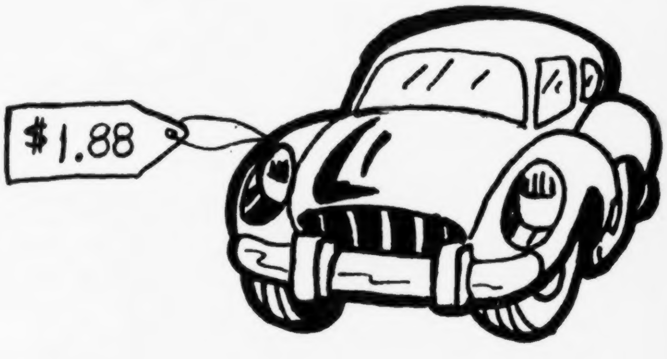
MAKE A TABLE TO SHOW ALL THE WAYS.

A			3					
B			4					

ANSWER: THERE ARE ___ WAYS TO PUT 7 FISH IN 2 BOWLS.

★ 6. HOW MANY DOLLAR BILLS WOULD YOU USE TO PAY FOR THE CAR, IF YOU DID NOT HAVE ANY COINS IN YOUR POCKET?

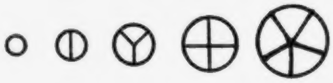
ANSWER: ___



STAR PROBLEMS
GRADE 1, V

I DID THIS WORK MYSELF: ____________

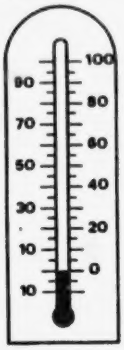
★ 1. DRAW THE SHAPE THAT COMES NEXT:



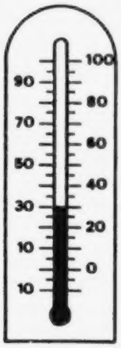
★★ 2. FILL IN THE BOX WITH A NUMBER THAT WILL MAKE THE SENTENCE CORRECT!

$10 = \boxed{} + 6$

★★ 3. WHAT IS THE TEMPERATURE? PRINT YOUR ANSWER ON THE LINE BENEATH EACH THERMOMETER.

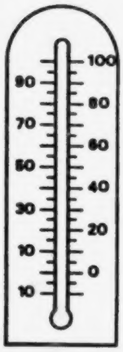

100
90
80
70
60
50
40
30
20
10
0
10

___°C

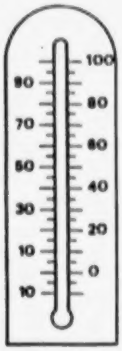

100
90
80
70
60
50
40
30
20
10
0
10

___°C

★★ 4. ON EACH THERMOMETER, DARKEN-IN THE MIDDLE SECTION TO SHOW THE TEMPERATURE GIVEN.


100
90
80
70
60
50
40
30
20
10
0
10

75 °C

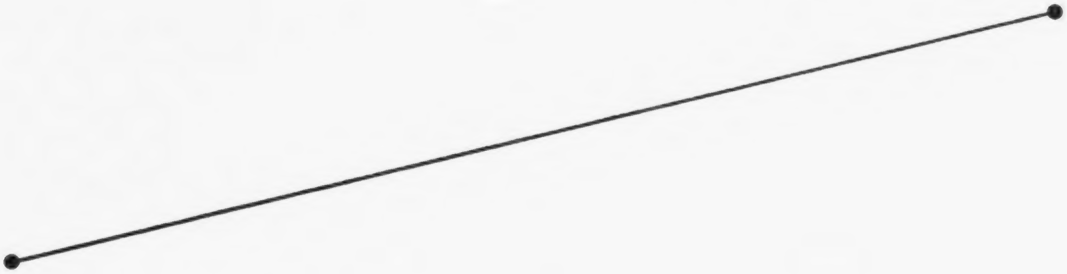

100
90
80
70
60
50
40
30
20
10
0
10

50 °C

★★ 5. MARY HAD A TEN DOLLAR BILL, AND BOUGHT A DOLL THAT COST $7. HOW MUCH CHANGE SHOULD SHE GET FROM THE STORE CLERK?

ANSWER: MARY SHOULD GET _____ BACK.

★ 6. HOLD THIS PAPER UP, AND FOLD IT SO THAT YOU DIVIDE THE LINE EXACTLY IN HALF. YOU CAN DO IT IF YOU PUT ONE END POINT ON TOP OF THE OTHER ONE AND THEN FOLD CAREFULLY.



★★★★ 7. PRACTICE ADDING IN YOUR HEAD ON THE PROBLEMS BELOW. YOU SHOULD FIND NUMBERS THAT ADD TO TEN, TO MAKE YOUR WORK EASIER.

6	7	1	5	9	4	0
8	5	7	2	6	5	2
4	5	3	7	1	6	5
+2	+3	2	5	5	2	5
		+9	3	+4	+5	+8
			+8			

WHEN YOU TURN IN YOUR PAPER, YOU WILL BE GIVEN A PROBLEM LIKE THOSE ABOVE, AND YOU'LL HAVE TO DO IT IN YOUR HEAD TO GET YOUR STARS. YOU CAN PUT YOUR ANSWER IN THE BOX BELOW, AS YOU TURN IN YOUR PAPER.

ANSWER: ☐

STAR PROBLEMS
GRADE 1, VI

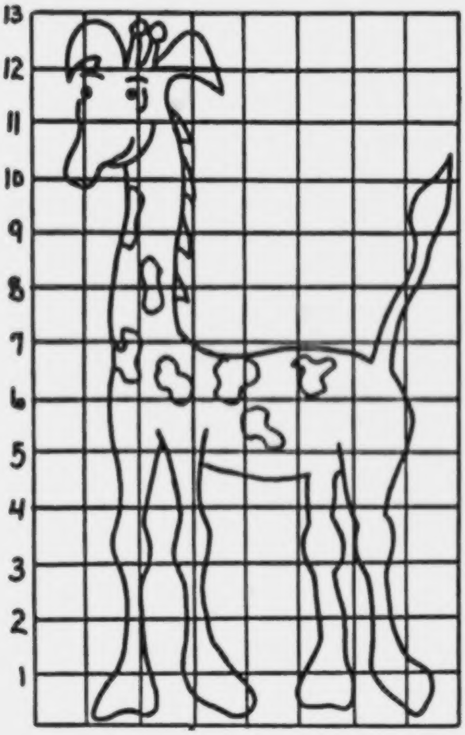
I DID THIS WORK MYSELF: ____________

★★★★ 1. ABOUT HOW TALL IS THE GIRAFFE? ___

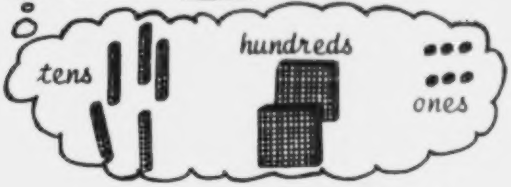
ABOUT HOW LONG IS THE NECK? ____

ABOUT HOW LONG ARE THE LEGS? ____

ABOUT HOW LONG IS THE TAIL? ____


13
12
11
10
9
8
7
6
5
4
3
2
1

★★ 2. WHAT NUMERAL IS SHOWN BELOW? ____

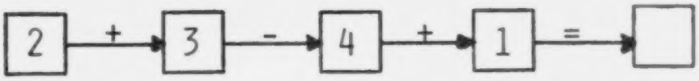

tens
hundreds
ones

★★ 3. WRITE THE NUMERAL FOR:

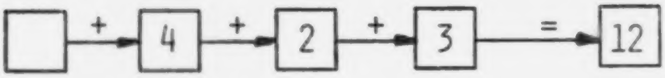
8 TENS + 4 ONES + 1 HUNDRED

ANSWER: ____

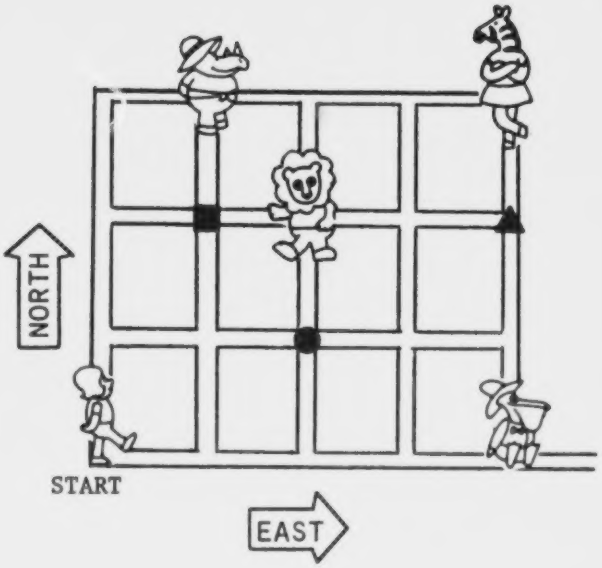
★★ 4. DO EACH STEP OF THE FLOWCHART. WRITE YOUR ANSWER IN THE EMPTY BOX.

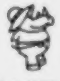


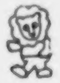
★★ 5. FIND THE NUMBER THAT GOES IN THE FIRST STEP OF THE FLOWCHART, TO GIVE THE CORRECT FINAL ANSWER. WRITE IT IN THE EMPTY BOX.

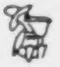


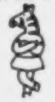
6. HELP THE GIRL GET FROM START TO EACH OF THE ANIMALS. TELL HER HOW FAR EAST TO GO, AND THEN HOW MANY BLOCKS NORTH.



★ TO GET TO  GO:
1 EAST AND 3 NORTH.

★ TO GET TO  GO:
___ EAST AND ___ NORTH.

★ TO GET TO  GO:
___ EAST AND ___ NORTH.

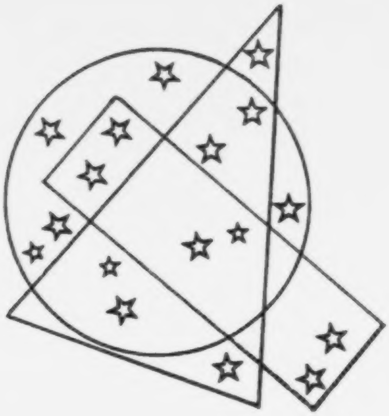
★ TO GET TO  GO:
___ EAST AND ___ NORTH.

7. DRAW THE SHAPE (CIRCLE, TRIANGLE, OR SQUARE) THE GIRL WOULD FIND, IF SHE TOOK THESE TRIPS:

★ 2 BLOCKS EAST, 1 BLOCK NORTH: _____

★ 4 BLOCKS EAST, 2 BLOCKS NORTH: _____

★ 1 BLOCK EAST, 2 BLOCKS NORTH: _____



★ 8. HOW MANY STARS ARE THERE IN THE TRIANGLE? ___ STARS

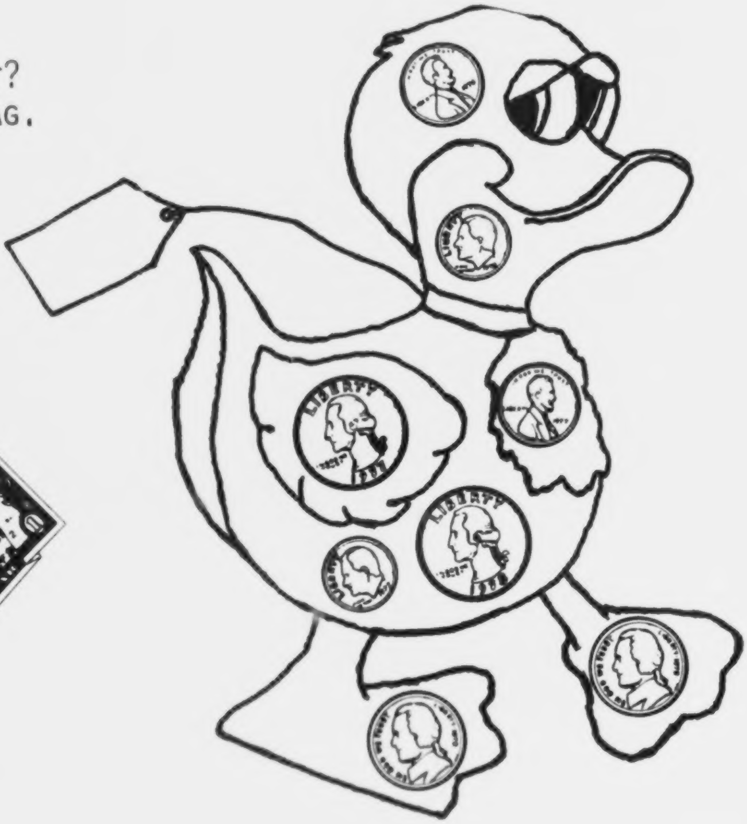
★ 9. HOW MANY STARS ARE IN THE CIRCLE? __ STARS

★ 10. HOW MANY STARS ARE IN THE RECTANGLE? __ STARS

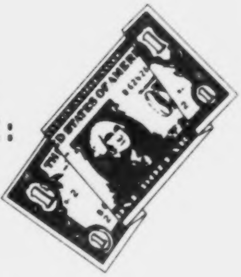
STAR PROBLEMS
GRADE 1, VII

I DID THIS WORK MYSELF:____________

★★★ 1. HOW MUCH DOES THE DUCK COST?
WRITE YOUR ANSWER ON THE TAG.



★★★ 2. YOU BUY THE DUCK
WITH ONE OF THESE:
HOW MUCH CHANGE
WOULD YOU GET?

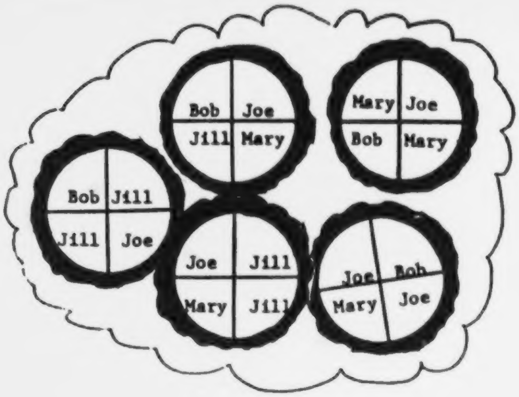


ANSWER: __ ¢

★ 3. PUT A NUMBER IN EACH EMPTY
↙ BOX IN THE TABLE, TO MAKE
A TRUE SENTENCE. THE FIRST
ONE IS DONE FOR YOU.

10	IS GREATER THAN	6
35	IS LESS THAN	
76	IS GREATER THAN	
88	IS LESS THAN	
27	IS LESS THAN	
149	IS GREATER THAN	
500	IS LESS THAN	
1	IS GREATER THAN	
399	IS GREATER THAN	
1	IS LESS THAN	

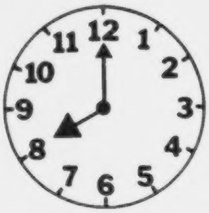
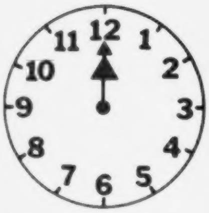
★★ 4. MAKE A GRAPH OF THE NUMBER OF PIECES OF PIE THAT EACH CHILD ATE.


Bob
Joe
Jill
Mary
Mary
Joe
Bob
Mary
Bob
Jill
Jill
Joe
Joe
Jill
Mary
Jill
Joe
Bob
Mary
Joe

GRAPH

Jill							
Bob							
Joe							
Mary							
	1	2	3	4	5	6	7

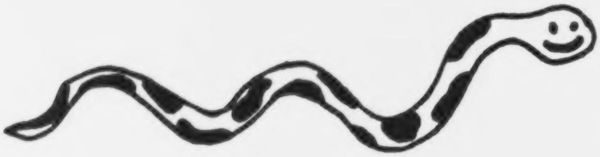
pieces eaten

★★ 5. JAY CAME TO SCHOOL AT  JAY ATE LUNCH AT 

HOW MUCH TIME PASSED BEFORE JAY ATE LUNCH? ____ HOURS

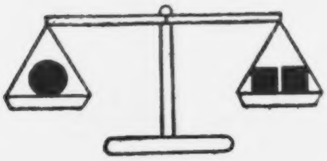
★★★ 6. ABOUT HOW LONG IS SANDY, THE SNAKE? CIRCLE YOUR ANSWER BELOW.

(HINT: YOU MAY USE A RULER, STRING, OR CENTIMETER BLOCKS TO HELP MEASURE.)



ABOUT 7 CENTIMETERS
ABOUT 10 CENTIMETERS
ABOUT 13 CENTIMETERS

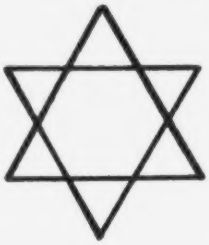
★★ 7. WHICH WEIGHS MORE, A ● OR A ■ ? ANSWER: ____________



STAR PROBLEMS
GRADE 1, VIII

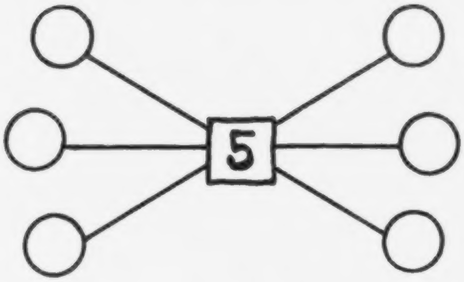
I DID THIS WORK MYSELF______________

✱✱ 1. HOW MANY DIFFERENT TRIANGLES CAN YOU FIND IN THE FIGURE BELOW?

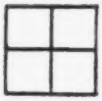


ANSWER:_____

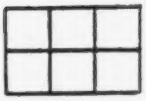
★★★ 2. PUT 2, 3, 4, 6, 7, AND 8 IN THE CIRCLES SO THAT THE SUM ALONG EACH LINE IS 15. USE EACH NUMBER JUST ONCE.



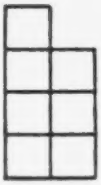
★ 3. HOW MANY UNIT SQUARES DOES IT TAKE TO MAKE EACH SHAPE BELOW?
(HINT: A UNIT SQUARE IS THIS SIZE: ☐)



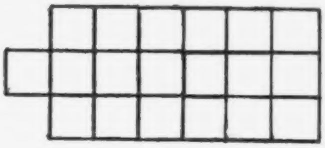
___



___



___



___

*** 4. PUT THE NUMBERS INSIDE THE BARREL WHERE THEY BELONG!

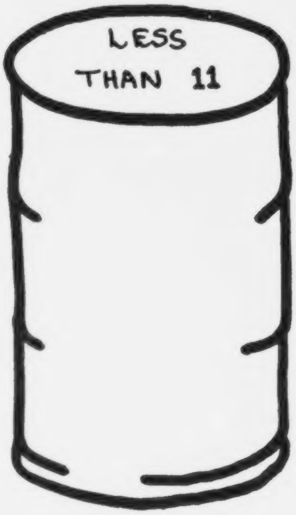
HINT: 3 NUMBERS WILL NOT BELONG IN ANY OF THESE BARRELS.

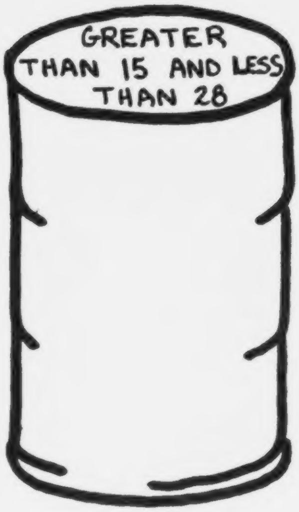
WHICH BARREL?

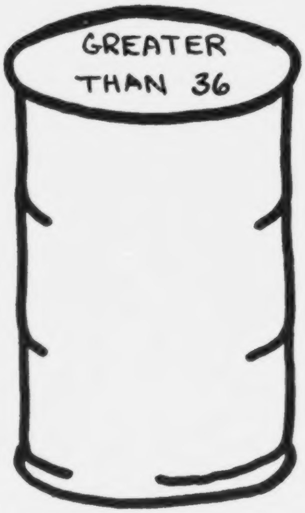
38 17 48 34

29 25 5 10

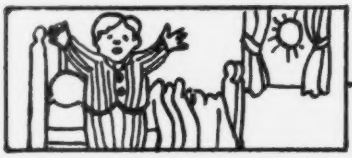
20 3 31 42


LESS
THAN 11


GREATER
THAN 15 AND LESS
THAN 28


GREATER
THAN 36

*** 5. PUT THE PICTURES BELOW IN ORDER, FROM THE FIRST TO THE LAST ACTIVITY OF A DAY.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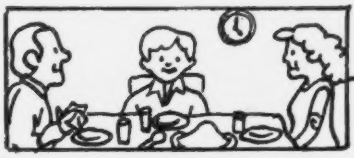
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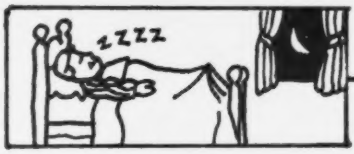
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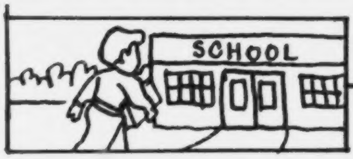

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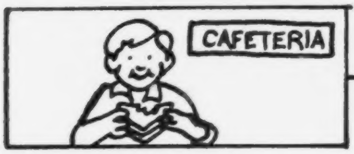

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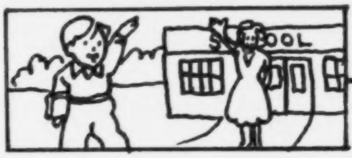

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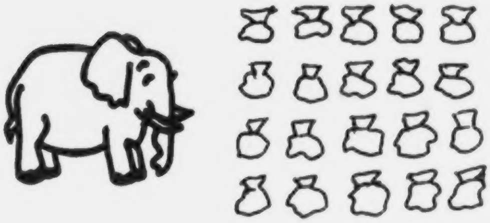
STAR PROBLEMS
GRADE 1, IX

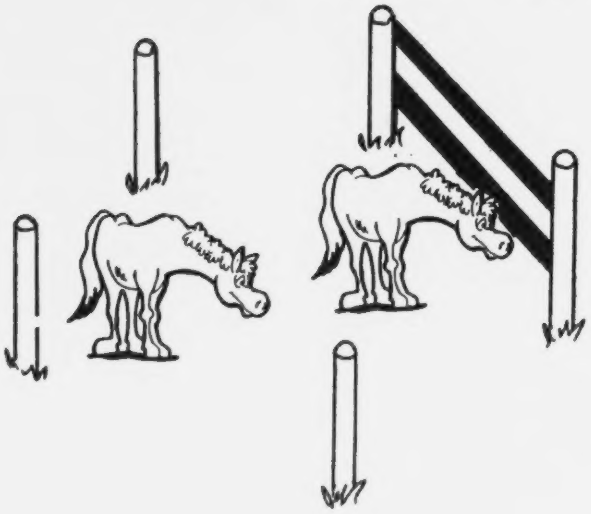
I DID THIS WORK MYSELF______________

★★ 1. ELLIE THE ELEPHANT LOVES PEANUTS. SHE ATE 20 BAGS OF PEANUTS IN 3 DAYS. SHE ATE 3 BAGS ON THE FIRST DAY. SHE ATE 7 BAGS ON THE SECOND DAY. HOW MANY BAGS DID SHE EAT ON THE THIRD DAY?



ANSWER____________

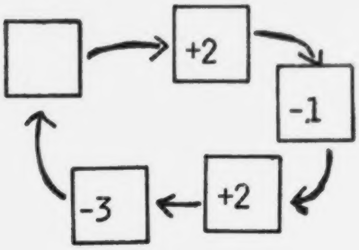
★★ 2. FARMER BROWN WANTS TO PUT SOME MORE BOARDS ON THE FENCE POSTS, TO MAKE A PLACE TO KEEP HIS HORSES. HOW MANY MORE BOARDS DOES HE NEED TO BUY?



HINT: DRAW THE NEW BOARDS AND THEN COUNT THEM.

ANSWER: ____

★★★ 3. IF YOU START WITH A NUMBER AND FOLLOW THE ARROWS YOU WILL END WITH THE STARTING NUMBER. WRITE THE NUMBER IN THE BOX.



★ 4. BARRY KEEPS A CHART ON VISITS HE MAKES TO THE ZOO EACH MONTH. USE THE CHART BELOW TO TELL WHAT MONTH HE MADE THE MOST VISITS.

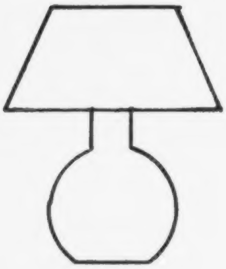
ANSWER________________

VISITS TO THE ZOO	
JANUARY	2 VISITS
FEBRUARY	0 VISITS
MARCH	5 VISITS
APRIL	3 VISITS
MAY	1 VISIT

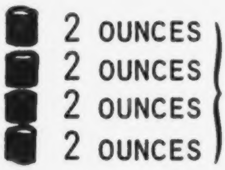
★ 5. USE THE CHART ABOVE TO TELL WHAT MONTH BARRY VISITED THE ZOO 3 TIMES.

ANSWER____________________

★★ 6. AN ANGLE IS WHERE TWO STRAIGHT LINES MEET. PUT AN X ON THE ANGLES YOU SEE ON THE PICTURE OF A LAMP.



★★ 7. LENNY WANTED TO FILL A CONTAINER WITH LEMONADE. HE NEEDED 4 GLASSES TO FILL THE CONTAINER. EACH GLASS HELD 2 OUNCES OF LEMONADE. HOW MANY OUNCES DID THE CONTAINER HOLD?



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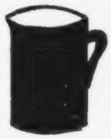
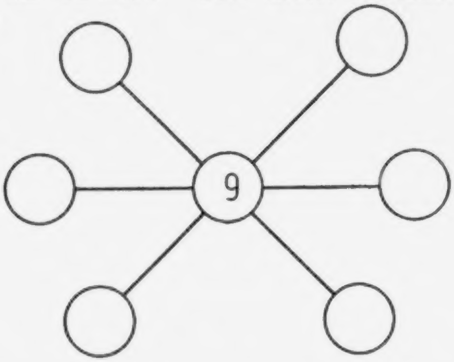


= _______OUNCES

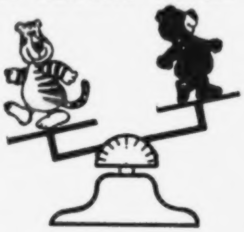
STAR PROBLEMS
GRADE 1, X

I DID THIS WORK MYSELF:________________

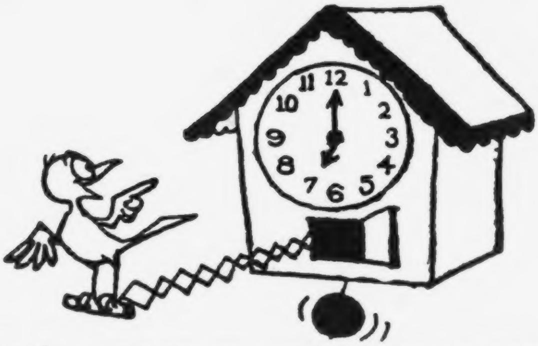
★★★ 1. PUT 2, 3, 4, 6, 7, AND 8 IN THE CIRCLES SO THAT THE SUM ALONG EACH LINE IS 19. USE EACH NUMBER JUST ONCE.



★ 2. WHICH WEIGHS MORE? CIRCLE THE ANIMAL.

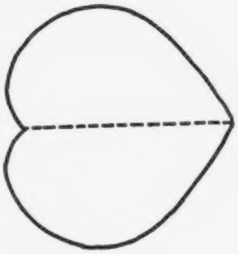


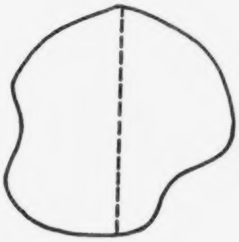
★★ 3. AMY GOT UP AT 7:00 AM. WHAT TIME WILL IT BE IN THREE HOURS?

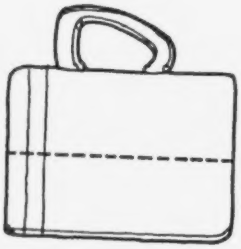


ANSWER: ____________

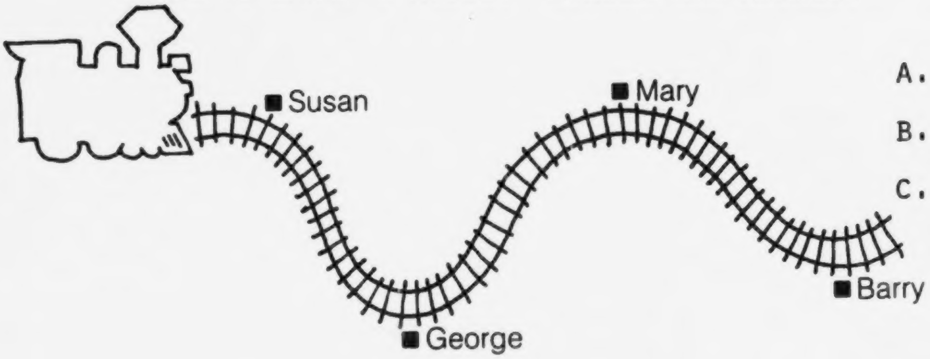
★★ 4. COLOR THE SHAPES THAT CAN BE FOLDED TO MATCH.







★★★ 5. JAN HAS A TOY TRAIN. SHE PLACED GEORGE'S HOUSE 2 METERS FROM SUSAN'S HOUSE. GUESS HOW FAR IT IS FROM GEORGE'S HOUSE TO BARRY'S HOUSE. CIRCLE THE ANSWER.


Susan
Mary
George
Barry

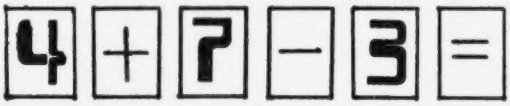
A. ABOUT 1 METER

B. ABOUT 4 METERS

C. ABOUT 20 METERS

★★ 6. JODY DID THIS PROBLEM ON HER CALCULATOR.

SHE PUSHED



WHAT ANSWER DID SHE SEE?

ANSWER: ____

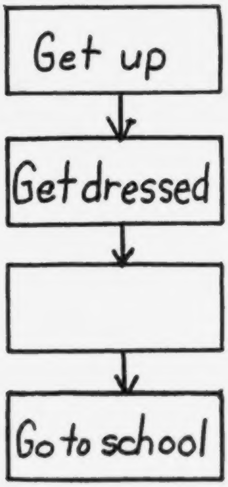
★★ 7. LOOK AT THIS FLOWCHART. CIRCLE THE MISSING STEP.

TAKE A BATH

EAT BREAKFAST

EAT DINNER

GO SWIMMING


Get up
Get dressed
Go to school

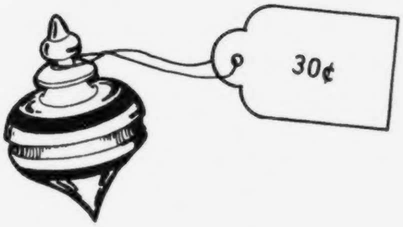
STAR PROBLEMS
GRADE 1, XI

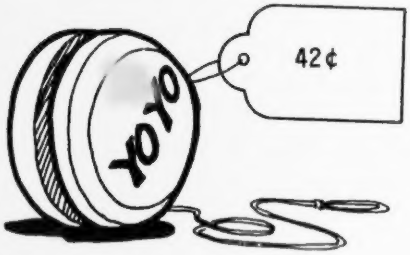
I DID THIS WORK MYSELF ____________________

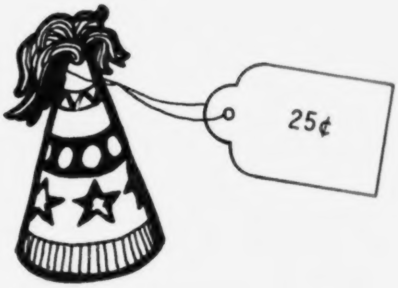
★★ 1. 7 CATS
5 DOGS
8 HATS
2 RABBITS
HOW MANY ANIMALS IN ALL?

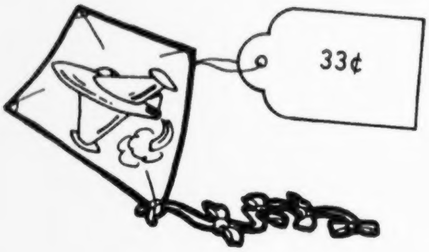
ANSWER: ______________

★★★ 2.









PABLO WANTS A TOP, A KITE AND A HAT. HOW MUCH WILL THEY COST IN ALL?

ANSWER: ______________

★ 3. CIRCLE THE WORD THAT MAKES THIS STATEMENT TRUE.

YOU WOULD MEASURE THE LENGTH OF YOUR CLASSROOM IN ____________.

CELSIUS LITERS METERS GRAMS

★ 4. IF YOUR MOTHER MADE 24 COOKIES AND YOU ATE 1 COOKIE, HOW MANY COOKIES DID YOU EAT?

ANSWER: ______________

★ 5. IS THIS NUMBER SENTENCE TRUE OR FALSE?

7+5 = 6+6

ANSWER: ________________

★ 6. YOU LEAVE HOME AT 3:30 P.M. YOUR MOTHER TELLS YOU TO BE HOME IN ONE HOUR. WHAT TIME MUST YOU BE HOME?

ANSWER: ________________

★★★ 7. JENNY ASKED THE STUDENTS IN HER CLASS WHICH COLOR THEY LIKED BEST. SHE MADE THIS TABLE.

COLOR	NUMBER
RED	10
BLUE	8
YELLOW	6
GREEN	3
PURPLE	7

A) HOW MANY STUDENTS LIKED BLUE BEST? ________________

B) WHICH COLOR WAS CHOSEN 7 TIMES? ________________

C) MOST OF THE STUDENTS LIKED WHICH COLOR BEST? ________________

★★ 8. FIND THE ANSWER TO THIS PROBLEM BY USING A CALCULATOR.

9833 - 4296 ANSWER: ________________

TURN THE CALCULATOR UPSIDE DOWN.

THE ANSWER SPELLS A WORD THAT IS THE OPPOSITE OF "MORE."

WHAT IS THE WORD? ____________________

STAR PROBLEMS
GRADE 1, XII

I DID THIS WORK MYSELF: ______________

★★★★ 1. HOW MANY 2-DIGIT NUMERALS CAN YOU MAKE, USING THE DIGITS IN THE BOX?

5 7 8

ANSWER: I CAN MAKE ___ NUMERALS.

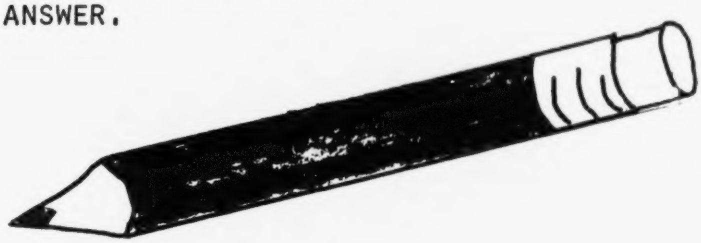
Hint : make a list, starting with 55.

★★ 2. FOR YOUR BIRTHDAY, YOUR GRANDMA GIVES YOU $1, YOUR MOM GIVES YOU $2, AND YOUR DAD GIVES YOU $4. HOW MUCH MONEY DID YOU GET FOR YOUR BIRTHDAY? _____

IF YOU WANT TO BUY A STICKER BOOK FOR $5, HOW MUCH WILL YOU HAVE LEFT? ____

★ 3. HOW MANY CENTIMETERS LONG IS THIS PENCIL? CIRCLE THE CORRECT ANSWER.

(A) 1 CM
(B) 5 CM
(C) 10 CM
(D) 20 CM

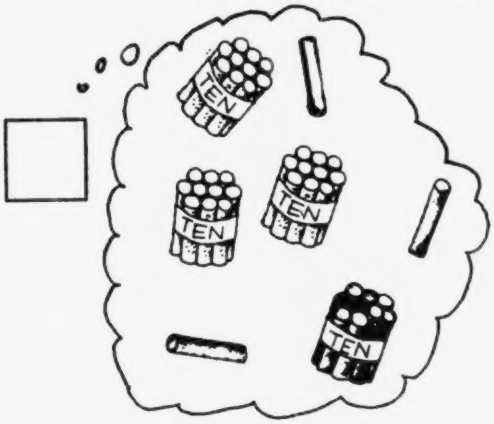


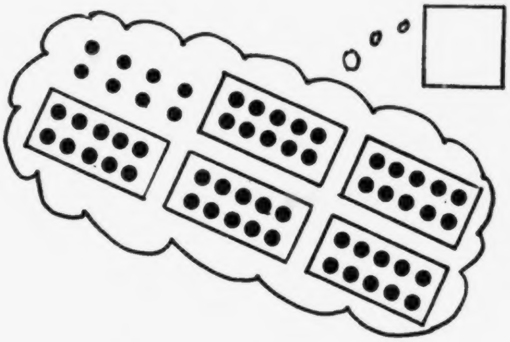
★★★★ 4. FILL IN EACH SQUARE WITH A NUMBER SO THAT EACH LINE ACROSS AND DOWN, HAS A SUM OF 11.

Add →
↓

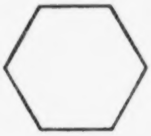
5		1	=11
	3		=11
		4	=11
=11	=11	=11	

★ 5. PUT THE NUMBER SHOWN BY EACH PICTURE, IN THE SQUARE.



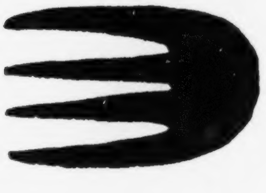


★ 6. AN ANGLE IS A CORNER WHERE TWO STRAIGHT LINES MEET. HOW MANY ANGLES ARE THERE IN THE SHAPE TO THE RIGHT?



ANSWER: ____ ANGLES

★ 7. DRAW A HANDLE ON THIS FORK. MAKE THE HANDLE 10 CENTIMETERS LONG.



★★★ 8. A PENNY HAS TWO SIDES. THE SIDE WITH A PERSON'S FACE IS CALLED "HEADS", AND THE OTHER SIDE IS CALLED "TAILS."

TOSS A PENNY IN THE AIR 10 TIMES, AND LET IT LAND ON THE FLOOR. MARK ON THE CHART BELOW EACH HEAD AND EACH TAIL YOU GET.

	TOSS									
	1	2	3	4	5	6	7	8	9	10
HEADS →										
TAILS →										

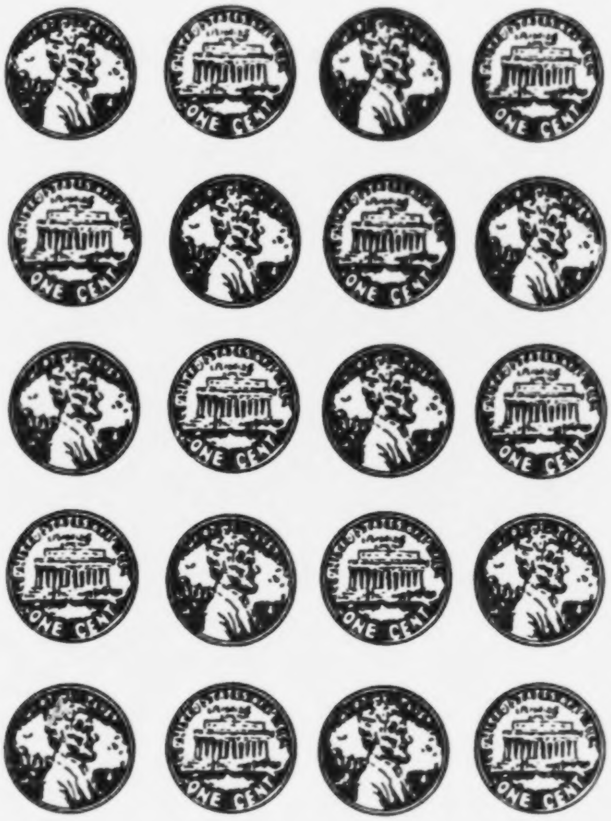
WHICH SIDE LANDED UP MOST OFTEN, OR DID HEADS LAND UP THE SAME NUMBER OF TIMES AS TAILS?

ANSWER: ____________________

STAR PROBLEMS
GRADE 1, XIII

I DID THIS WORK MYSELF: ____________

★ 1. HOW MANY PENNIES ARE THERE BELOW? ANSWER: ____

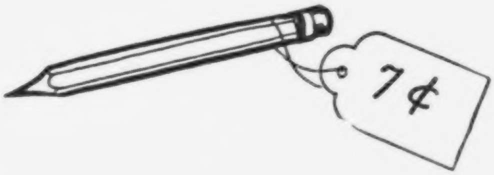


★★ 2. IF YOU AND A FRIEND SHARED THE PENNIES ABOVE EQUALLY,
HOW MANY PENNIES WOULD YOU GET?

ANSWER: I'D GET ___ PENNIES.

★★★★ 3. HOW MANY PENCILS COULD YOU
BUY WITH 20 PENNIES?

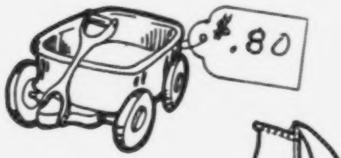
ANSWER: ___ PENCILS

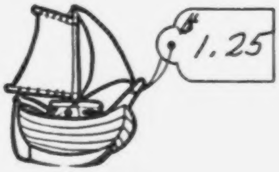


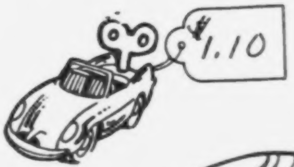
★★★ 4. YOU HAVE 20 PENNIES. HOW MUCH MONEY
WOULD YOU HAVE LEFT IF YOU BOUGHT
ALL THE PENCILS YOU COULD BUY?

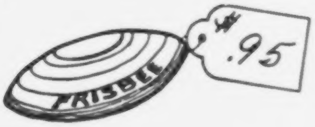
ANSWER: I'D HAVE ___ ¢ LEFT.

★★ 5. PUT AN X ON ANY OF THE TOYS YOU COULD BUY WITH A ONE-DOLLAR BILL.









★★ 6. DRAW A LINE TO THE NUMBER THAT IS THE CORRECT SUM OR DIFFERENCE.

3+4
5+2
5−1
3−3
7+2
2−1
3+0

3
2
8
6
7
9
5
0
1
4

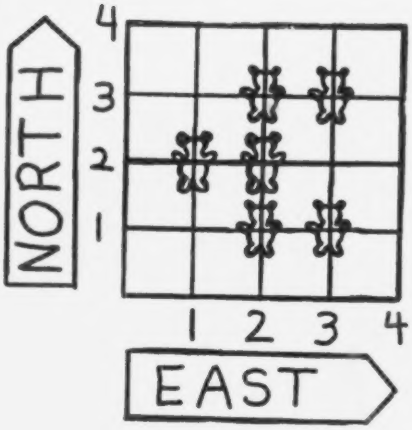
STAR PROBLEMS I DID THIS WORK MYSELF:____________

GRADE 1, XIV

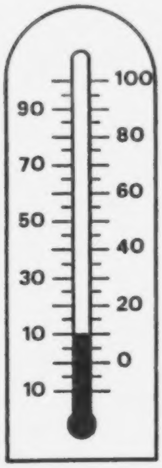
★★★ 1. COLOR THE BEAR RED AT:
EAST 3, NORTH 3

COLOR THE BEAR BLUE AT:
EAST 1, NORTH 2

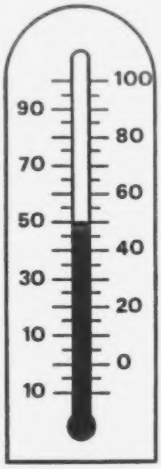
COLOR THE BEAR GREEN AT:
EAST 2, NORTH 3


NORTH
4
3
2
1
1
2
3
4
EAST

★ 2. LOOK AT THE THERMOMETERS BELOW. WHAT IS THE TEMPERATURE SHOWN ON EACH THERMOMETER? WRITE THE TEMPERATURE IN THE BLANK BELOW THE THERMOMETER.


100
90
80
70
60
50
40
30
20
10
0
10

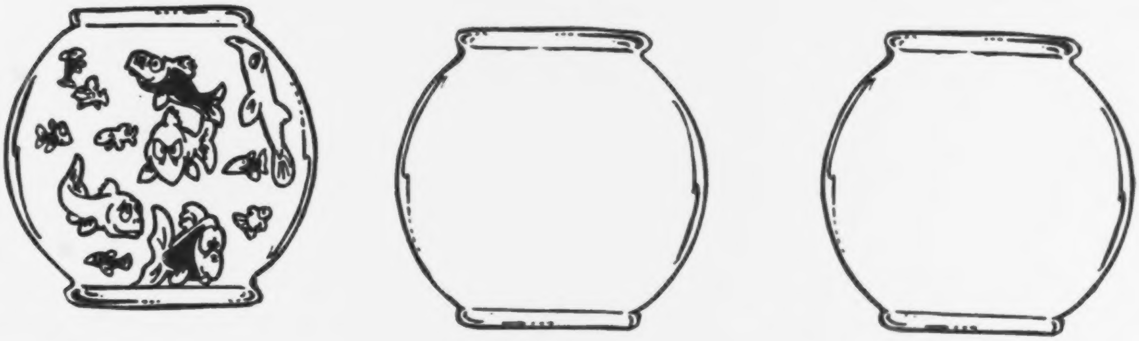
____°C


100
90
80
70
60
50
40
30
20
10
0
10

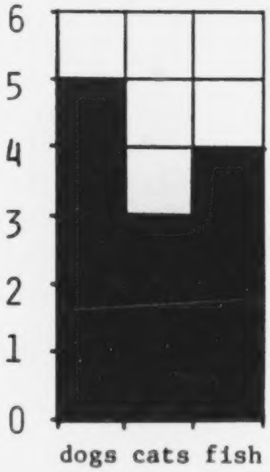
____°C

★★★ 3. THERE ARE TOO MANY FISH IN THE FISH BOWL. TAKE ENOUGH OF THEM OUT AND PUT THEM IN THE OTHER BOWLS SO YOU WILL HAVE THE EXACT SAME NUMBER IN ALL THREE BOWLS. HOW MANY WILL YOU HAVE IN EACH BOWL?

ANSWER: ___ FISH



★ 4. JOSE'S CLASS MADE A GRAPH SHOWING DIFFERENT KINDS OF PETS THEY OWNED. THEIR GRAPH LOOKED LIKE THIS:



HOW MANY CHILDREN OWNED DOGS? ________

HOW MANY CHILDREN OWNED CATS? ________

HOW MANY CHILDREN OWNED FISH? ________

STAR PROBLEMS
GRADE 1, XV

I DID THIS WORK MYSELF: ____________

★★ 1. YOU HAVE 5 PENNIES AND LOSE 2 PENNIES. ARE THE PENNIES YOU HAVE LEFT CLOSER IN NUMBER TO THE NUMBER OF SHOES IN A PAIR, OR TO THE NUMBER OF DAYS IN A WEEK?

CIRCLE THE CORRECT ANSWER: SHOES DAYS

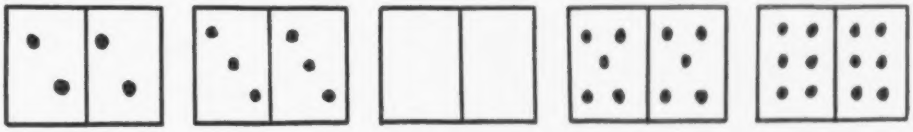
★★★ 2. LOOK AT THE NUMBERS IN THE SQUARE BELOW. DRAW A LINE AROUND NUMBERS THAT ADD TO THE NUMBER OF PENNIES IN A DIME. FIND TEN MORE TO GO WITH THE ONE THAT HAS BEEN DONE FOR YOU.

2	6	5	9	8	7	3
8	4	5	1	3	2	3
6	1	5	7	4	9	1
1	2	3	4	5	6	7
8	9	7	6	5	4	3
1	6	8	4	7	9	5
7	6	2	6	7	2	9
5	4	6	3	8	1	8

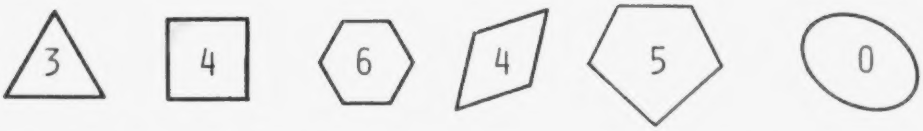
★ 3. THE SQUARE BELOW IS COVERING UP A NUMBER. WRITE THE CORRECT NUMBER IN THE SQUARE.

8 + ☐ = 12

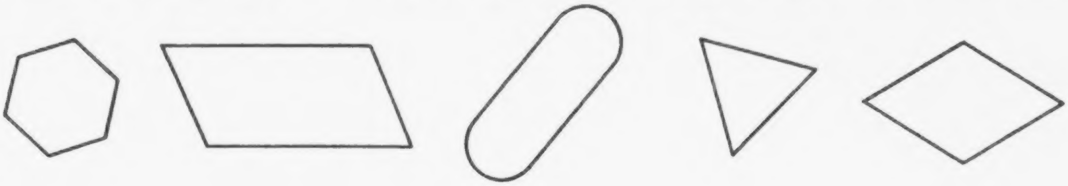
★★ 4. DRAW THE CORRECT NUMBER OF DOTS IN THE MIDDLE DOMINO BELOW, TO FIT THE PATTERN.



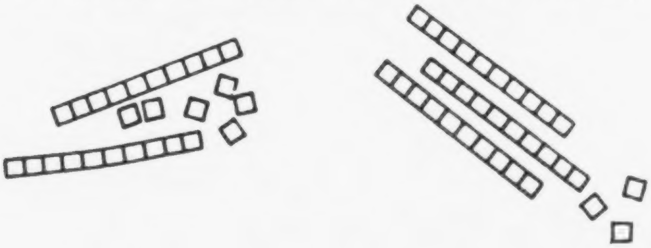
★★ 5. THE NUMBER OF CORNERS (VERTICES) HAS BEEN WRITTEN INSIDE EACH FIGURE BELOW:



WRITE THE NUMBER OF CORNERS (VERTICES) INSIDE EACH OF THESE FIGURES:



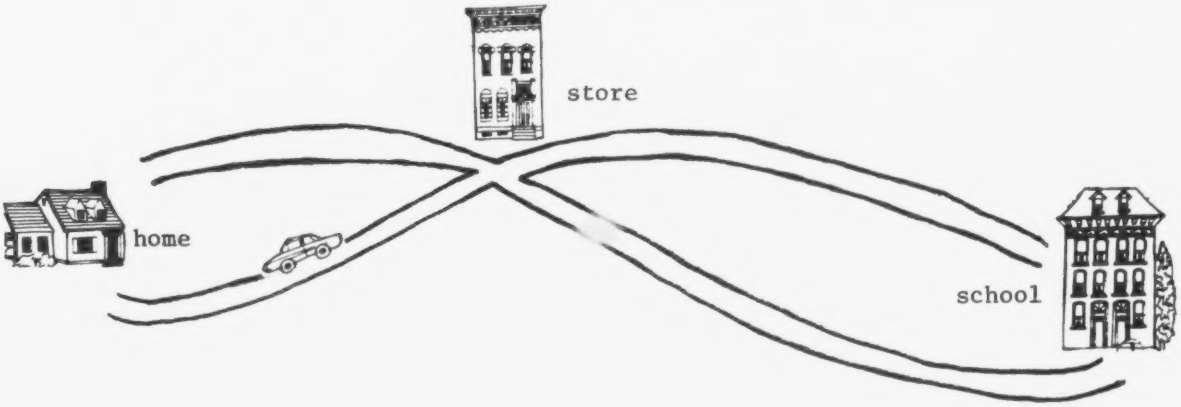
★★ 6. IF YOU PUSH THESE TWO PILES OF CUBES TOGETHER, HOW MANY WILL YOU HAVE? CIRCLE THE CORRECT ANSWER:



23
36
59
60

★★★ 7. USING THE MAP BELOW, HOW MANY DIFFERENT PATHS CAN YOU FIND FROM HOME TO SCHOOL?

ANSWER: THERE ARE __ DIFFERENT PATHS.



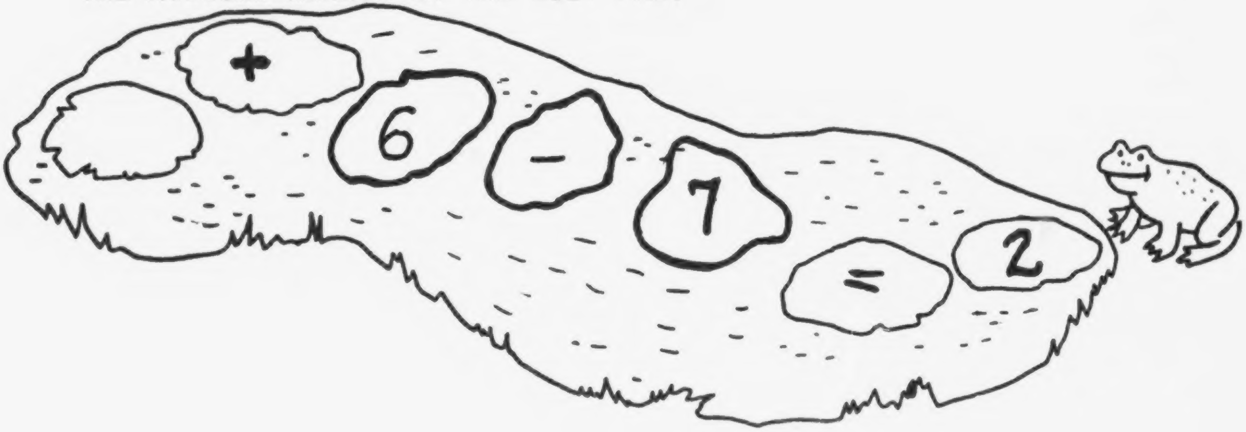
STAR PROBLEMS
GRADE 1, XVI

I DID THIS WORK MYSELF________________

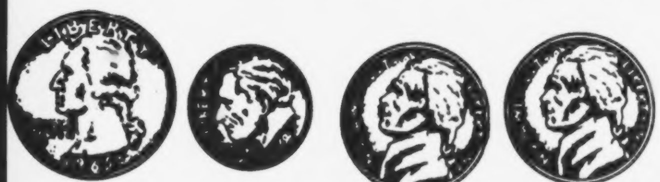
★★★ 1. 3 DUCKS.
2 BUNNIES.
1 DUCK RAN AWAY.
HOW MANY WERE LEFT?

ANSWER ________ ANIMALS

★★★ 2. HELP FREIDA THE FROG HOP BACK ACROSS THE POND. FILL IN THE MISSING NUMBER ON THE LILY PAD.

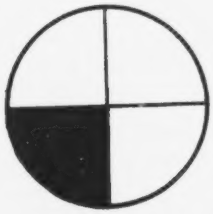


★ 3. HOW MUCH MONEY ALL TOGETHER?

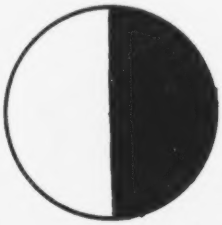


ANSWER________

★ 4. WHICH CIRCLE HAS MORE SHADED IN?



A



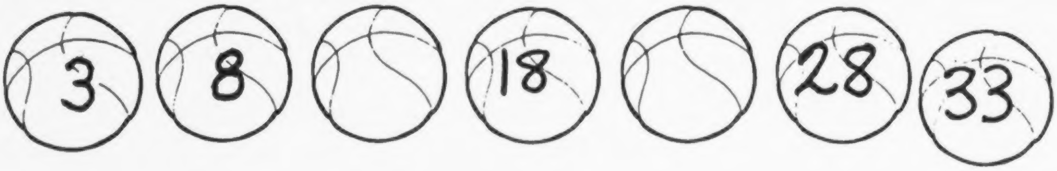
B

ANSWER________

★★ 5. HOW MANY DAYS IN 2 WEEKS?

ANSWER ________ DAYS

★★★ 6. FILL IN THE MISSING NUMBERS.



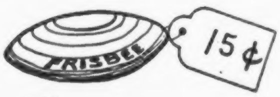
★★ 7. FRISBEE FOR 15¢

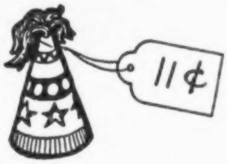
HAT FOR 11 ¢

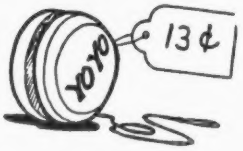
YOYO FOR 13¢

HOW MUCH FOR ALL 3 TOGETHER?

ANSWER: ______

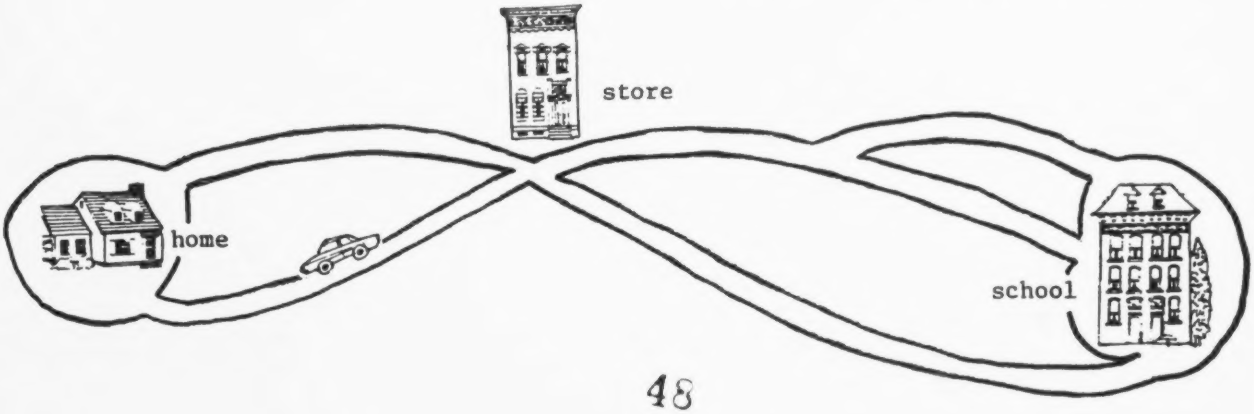






★★★ 8. USING THE MAP BELOW, HOW MANY DIFFERENT PATHS CAN YOU FIND FROM HOME TO SCHOOL?

ANSWER: THERE ARE __ DIFFERENT PATHS.


store
home
school

STAR PROBLEMS
GRADE 1, XVII

I HAVE DONE THIS WORK MYSELF: ______

★ 1. COLOR:

⊂ RED
⊃ BLUE
U GREEN

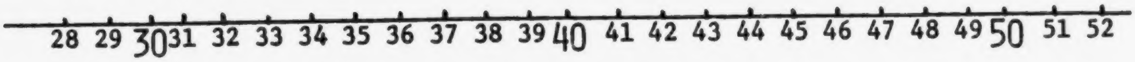
⊂	⊂	⊂	⊂	⊂	⊂	⊂
U	U	U	⊂	⊃	⊃	⊃
⊂	U	⊂	⊂	⊂	⊃	⊂
U	U	U	⊂	⊂	⊃	⊂

★★★ 2. USE THE TAX CHART TO FIND THE TOTAL THAT EACH PERSON SPENT.

TAX CHART

COST	TAX
BETWEEN 1¢ AND 20¢	1¢
BETWEEN 21¢ AND 40¢	2¢
BETWEEN 41¢ AND 60¢	3¢
BETWEEN 61¢ AND 80¢	4¢
BETWEEN 81¢ AND $1.00	5¢

	SPENT		TAX		TOTAL
SUE	50¢	+	______	=	______
ED	10¢	+	______	=	______
SAM	1¢	+	______	=	______
JANE	5¢	+	______	=	______
MIKE	25¢	+	______	=	______


28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52

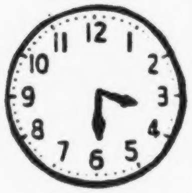
★★ 3. A. IS 32 CLOSER TO 30 OR 40? ____________

B. IS 49 CLOSER TO 40 OR 50? ____________

C. IS 38 CLOSER TO 30 OR 40? ____________

D. IS 44 CLOSER TO 30 OR 40? ____________

★ 4. THE MOVIE STARTED AT 3:30. IT IS 2 HOURS LONG. DRAW THE HANDS TO SHOW HOW THE CLOCK WILL LOOK WHEN THE MOVIE ENDS.


12
1
2
3
4
5
6
7
8
9
10
11

BEGINNING TIME

12
1
2
3
4
5
6
7
8
9
10
11

ENDING TIME

★★★★ 5. PRACTICE ADDING IN YOUR HEAD ON THE PROBLEMS BELOW. YOU SHOULD FIND NUMBERS THAT ADD TO TEN, TO MAKE YOUR WORK EASIER.

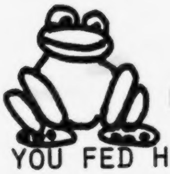
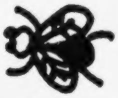
6	7	1	5	9	4	0
8	5	7	2	6	5	2
4	5	3	7	1	6	5
+2	+3	2	5	5	2	5
		+9	3	+4	+5	+8
			+8			

WHEN YOU TURN IN YOUR PAPER, YOU WILL BE GIVEN A PROBLEM LIKE THOSE ABOVE, AND YOU'LL HAVE TO DO IT IN YOUR HEAD TO GET YOUR STARS. YOU CAN PUT YOUR ANSWER IN THE BOX BELOW, AS YOU TURN IN YOUR PAPER.

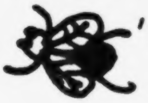
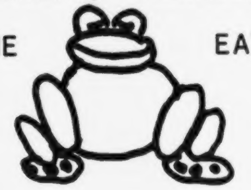
ANSWER: ☐

STAR PROBLEMS
GRADE 1, XVIII

I DID THIS WORK MYSELF: ____________

★★ 1.  EATS 5  'S EVERY DAY.

YOU FED HIM ON MONDAY, TUESDAY, WEDNESDAY, AND THURSDAY.

HOW MANY  'S HAS THE  EATEN?

ANSWER: __________

★★ 2. DRAW THE MISSING SHAPES ON THE LINES:

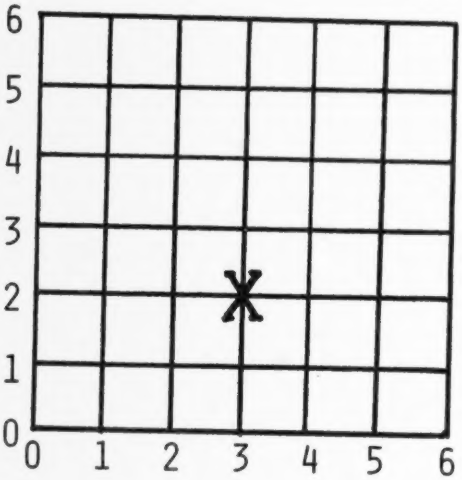
□ △ ○ ⬡ □ △ ___ ⬡ □ ___ ○

★★★ 3. DRAW A RED BALL AT (1,2).

DRAW A GREEN BALL AT (4,1).

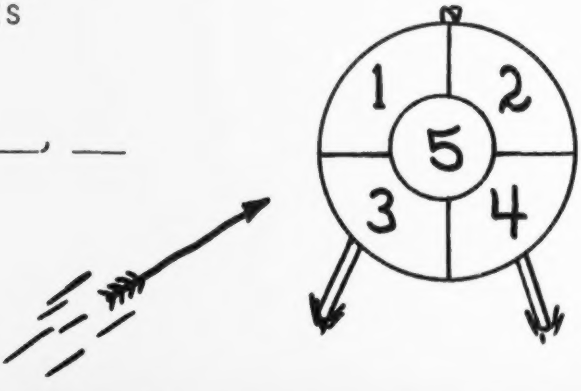
DRAW A BLUE BALL AT (2,4).

HINT: THE X IS AT (3,2).



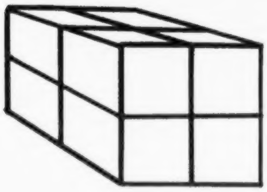
★★ 4. BILL SHOT 5 ARROWS. HE SCORED 16 POINTS. ON WHAT NUMBERS DID HIS ARROWS LAND?

ANSWER: ___, ___, ___, ___, ___



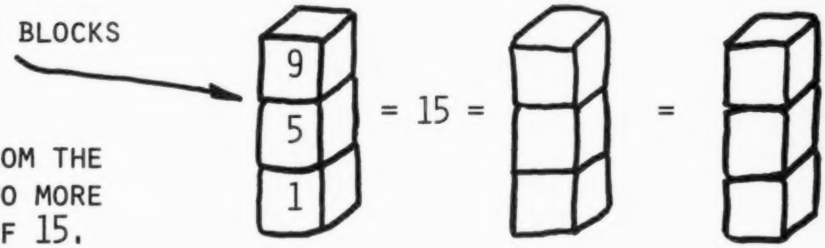
★ 5. HOW MANY SMALL CUBES DOES IT TAKE TO MAKE THIS SOLID?

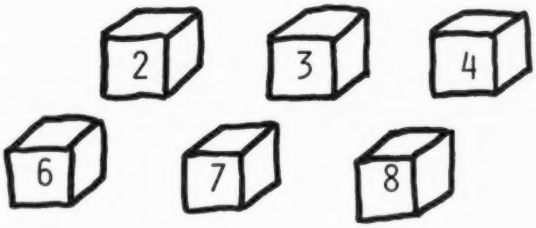
ANSWER: ____ CUBES

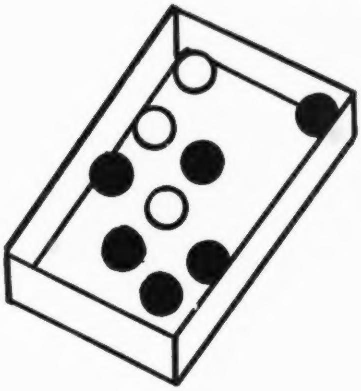


★★★★ 6. THE SUM OF THESE THREE BLOCKS IS 15.

CHOOSE YOUR NUMBERS FROM THE BLOCKS BELOW. MAKE TWO MORE PILES THAT HAVE SUMS OF 15. YOU CAN USE A BLOCK ONLY 1 TIME!







★ 7. HOW MANY MORE ●'S ARE THERE THAN ○'S IN THE BOX?

ANSWER: ___ MORE ●'S

★★★ 8. PUT EITHER "¢" OR "$" BESIDE EACH NUMBER BELOW, SO THE SENTENCE MAKES GOOD SENSE.

(A) A NEW DRESS MIGHT COST 24 .

(B) A BATTERY FOR A TOY MIGHT COST 98 .

(C) A SCHOOL LUNCH MIGHT COST 80 .

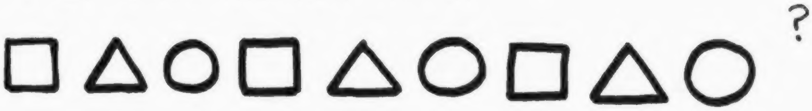
STAR PROBLEMS

GRADE 1, XIX

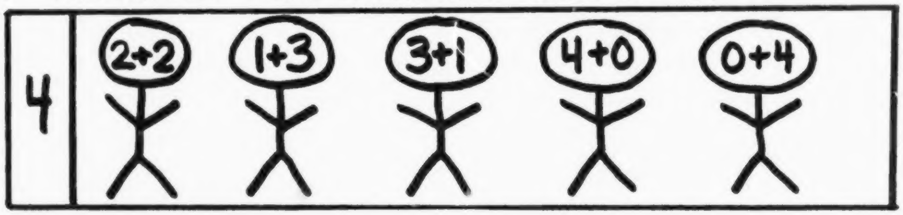
I DID THIS WORK MYSELF.

____

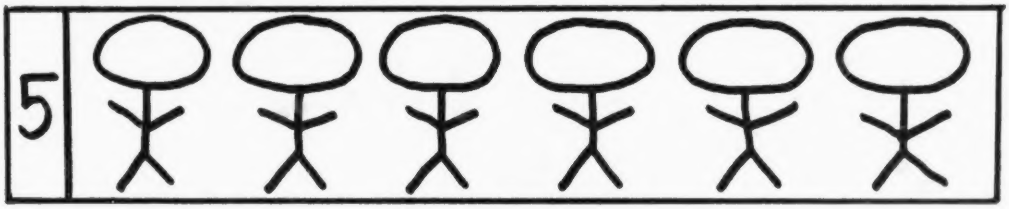
* 1. DRAW THE NEXT SHAPE.



** 2. THE NUMBER 4 HAS A FAMILY. HERE IT IS.



DRAW A FAMILY FOR 5.

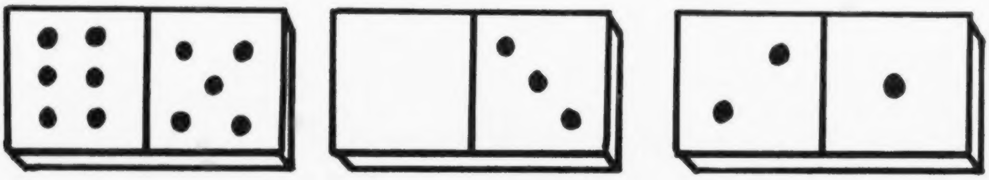


** 3. HERE IS A PAPER CLIP.

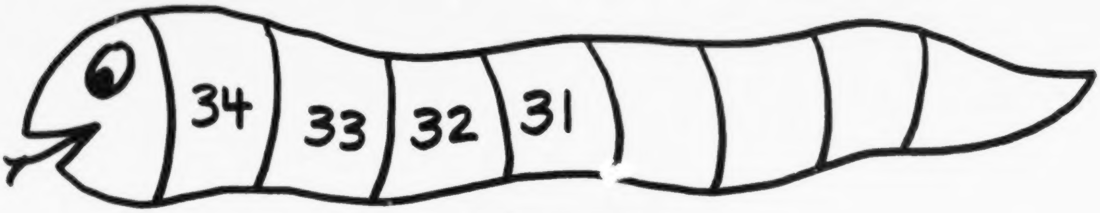
IF YOU MAKE A CHAIN OF THEM, HOW MANY PAPER CLIPS WOULD YOU NEED TO BE AS LONG AS THIS PENCIL?

ANSWER: ___ PAPER CLIPS

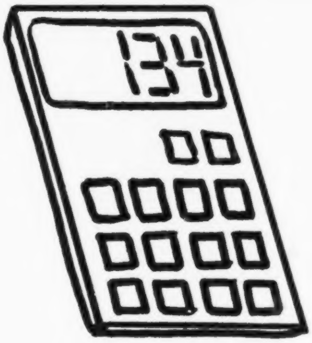
* 4. FILL IN THE MISSING DOTS.



** 5. PUT IN THE MISSING NUMBERS.

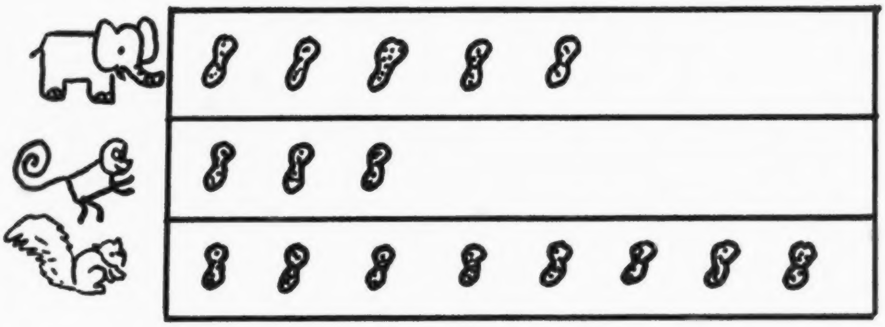


* 6. WHAT IS THIS NUMBER?

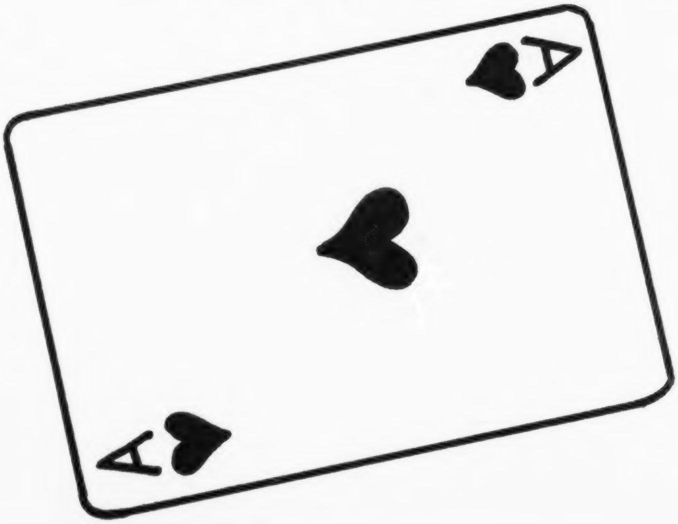


ANSWER ______

* 7. CIRCLE THE ANIMAL WHO ATE THE MOST PEANUTS.



*** 8. YOU HAVE A DECK OF PLAYING CARDS. ABOUT HOW MANY CARDS WOULD IT TAKE TO COVER THIS PAPER? (NO OVERLAPPING!)



ANSWER: ____ PLAYING CARDS

STAR PROBLEMS
GRADE 1, XX

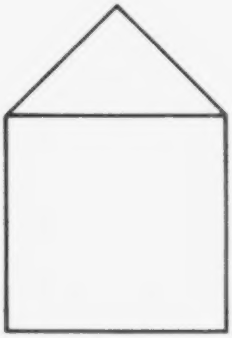
I DID THIS WORK MYSELF: ____________

★★ 1. MAKE HAPPY FACES NEXT TO EACH NAME TO SHOW HOW MANY EACH CHILD EARNED.

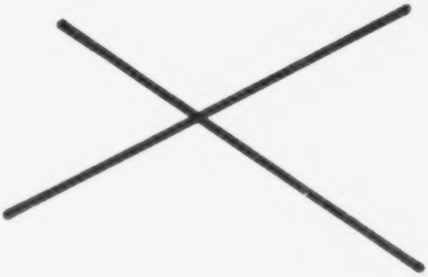
TOM - 4
JANE - 3
SUE - 2
BILL - 1

Jane	
Bill	
Tom	
Sue	

★ 2. DRAW A CIRCLE AROUND THE FIGURE THAT YOU CAN TRACE WITHOUT LIFTING YOUR PENCIL OR GOING OVER THE SAME LINE ONCE YOU START.

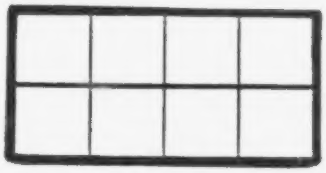


a



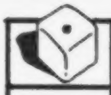
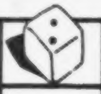
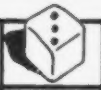
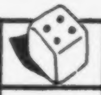
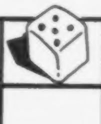
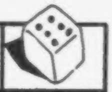
b

★ 3. HOW MANY SQUARE CENTIMETERS ARE IN THE SHAPE BELOW?

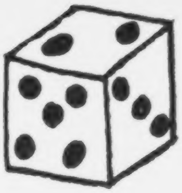


ANSWER: ____

★★ 4. ROLL A DIE 20 TIMES. MAKE A TALLY MARK EACH TIME BELOW THE FACE THAT LANDS "UP."

★★★ 5. HOW MANY FLAT FACES DOES A DIE HAVE? ____
HOW MANY EDGES DOES A DIE HAVE? ____
HOW MANY VERTICES (SHARP POINTS) DOES A DIE HAVE? ____

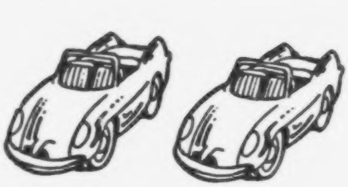


★★★ 6. A BAD STORM HIT TAMPA. IT RAINED 1 INCH THE FIRST HOUR, 2 INCHES THE SECOND HOUR, AND 3 INCHES THE THIRD HOUR. IF THE STORM KEPT GETTING WORSE, HOW MANY INCHES WOULD YOU EXPECT FOR THE FOURTH HOUR? ___ INCHES HOW MANY FOR THE FIFTH HOUR? ____ INCHES

★★★7. THREE GIRLS HAD NEW SHOES THE FIRST DAY OF SCHOOL, AND ONE OF THOSE GIRLS HAD A NEW BELT ALSO. DRAW A PICTURE OF THE GIRLS WITH NEW SHOES, AND THE NEW BELT. USE THIS PICTURE TO COUNT HOW MANY NEW THINGS TURNED UP AT SCHOOL THAT DAY.

PICTURE:

ANSWER: THERE WERE ___ NEW THINGS AT SCHOOL THAT DAY.



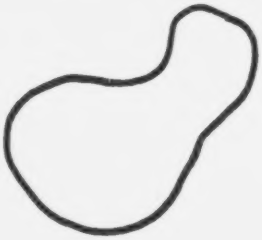
★★ 8. MR. JONES HAD TO BUY NEW TIRES FOR BOTH OF HIS CARS. HOW MANY DID HE HAVE TO BUY TO REPLACE ALL OF THE TIRES?

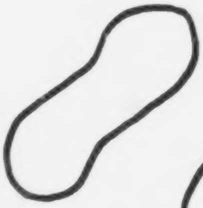
ANSWER: ____ TIRES

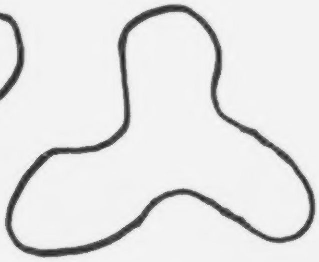
STAR PROBLEMS
GRADE 1, XXI

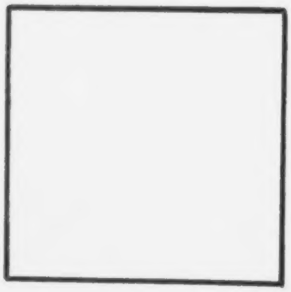
I DID THIS WORK MYSELF: ____________

★ 1. CIRCLE THE FIGURE THAT DOES NOT FIT IN THE BOX.



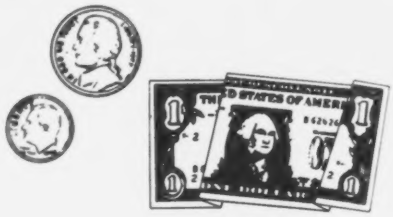






★★ 2. HOW MUCH MONEY DOES SUE
HAVE TO BUY A DOLL?

ANSWER: $__.__



★★★ 3. PUT >, <, OR = IN THE BOX TO MAKE THE STATEMENT TRUE.

$9 + 6 \boxed{} 20 - 5$

★★ 4. YOU HAVE $5 TO BUY A PRESENT FOR A FRIEND. CIRCLE THE PRESENTS BELOW THAT YOU MIGHT BE ABLE TO BUY WITH THAT MUCH MONEY.

A BICYCLE.

A TOY CAR.

A COLORING BOOK.

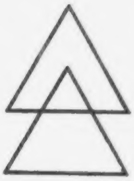
A SMALL TEDDY BEAR.

A COMPUTER.

A HORSE.

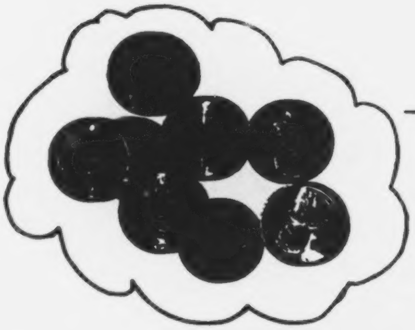
★★ 5. HOW MANY TRIANGLES CAN YOU
FIND IN THE PICTURE?

ANSWER: ___



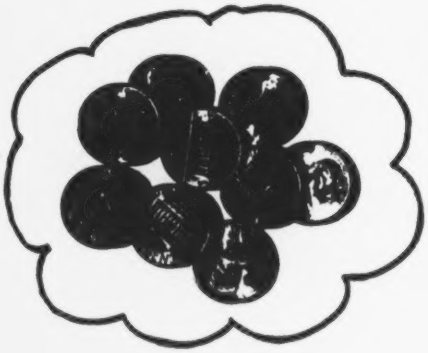
★★★★ 6. A GROUP OF PENNIES IS CALLED EVEN IF YOU AND A FRIEND COULD DIVIDE UP THE GROUP EQUALLY, WITH NO PENNIES LEFT OVER. IF A PENNY IS LEFT OVER WHEN YOU DIVIDE THE GROUP, THAT GROUP IS CALLED ODD.

WRITE EVEN OR ODD BESIDE EACH GROUP OF PENNIES BELOW.

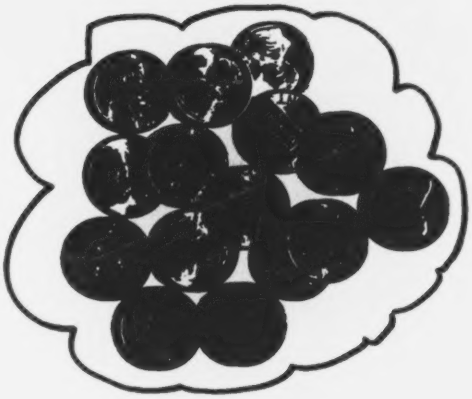


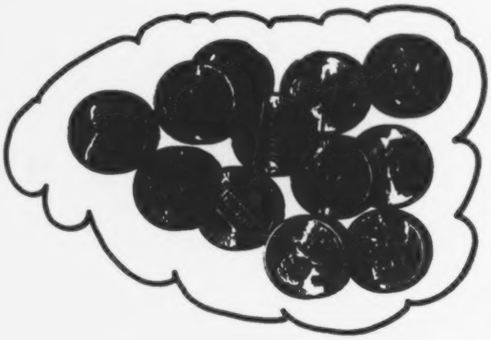
______

______



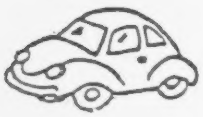
______





______

★★ 7. THE CAR TO THE RIGHT IS ABOUT 8 FEET LONG (FRONT TO BACK). CIRCLE THE SENTENCE BELOW THAT MAKES SENSE.



(A) THE CAR IS ABOUT 8 FEET HIGH.

(B) THE CAR IS ABOUT 6 FEET HIGH.

(C) THE CAR IS ABOUT 10 FEET HIGH.

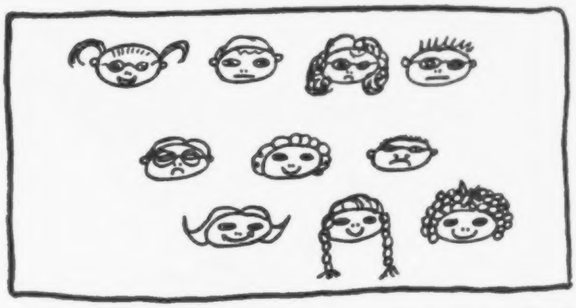
STAR PROBLEMS
GRADE 1, XXII

I DID THIS WORK MYSELF: ____________

★★ 1. THERE ARE 9 BOYS AND 6 GIRLS AT A PARTY. HOW MANY KIDS ARE AT THE PARTY? ____

HOW MANY MORE BOYS ARE ARE THERE THAN GIRLS? ____

★★ 2. LOOK AT THE PICTURE BELOW. IT SHOWS SOME OF THE CHILDREN WHO WENT TO THE PARTY.



HOW MANY KIDS ARE IN THE PICTURE? ____

HOW MANY ARE BOYS? ____

HOW MANY ARE GIRLS? ____

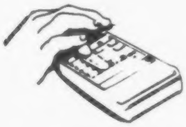
ARE THERE MORE BOYS, OR MORE GIRLS? ____

HOW MANY CHILDREN ARE WEARING GLASSES? ____

HOW MANY LOOK HAPPY? ____

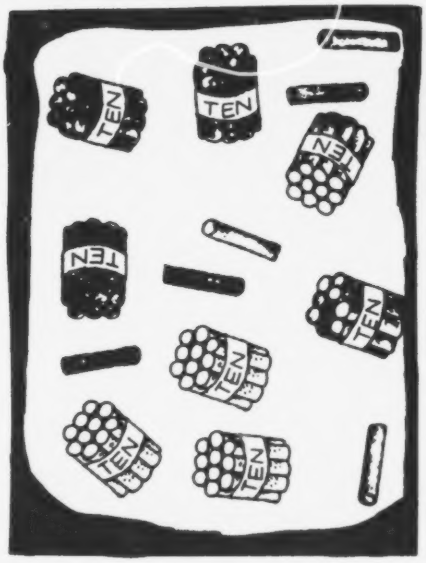
WHICH GROUP LOOKS HAPPIER, THE BOYS OR THE GIRLS? _____

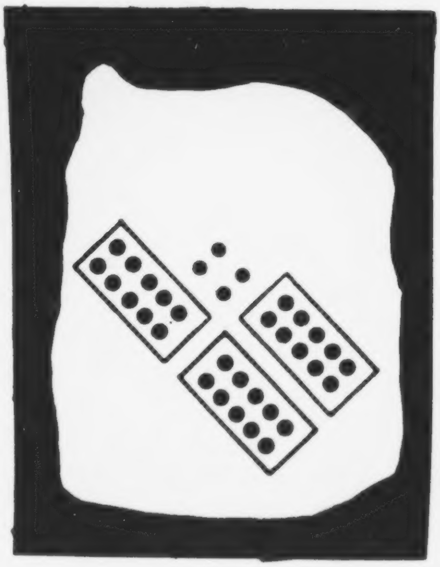
★ 3. DO THIS PROBLEM ON YOUR

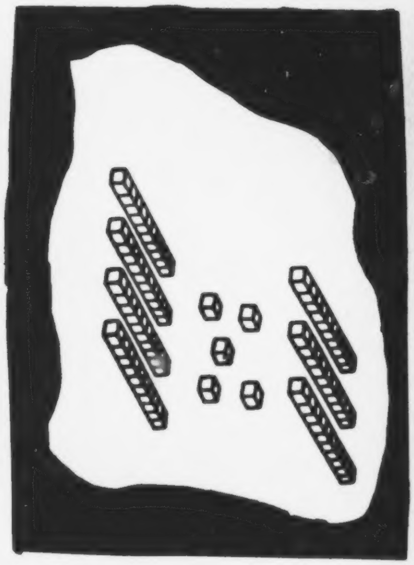


$1 + 2 + 3 + 4 + 5 =$ _____

★★★ 4. LOOK AT THE SETS OF TENS AND ONES BELOW. WRITE THE NUMBER THAT EACH GROUP SHOWS.


TEN
TEN
TEN
TEN
TEN
TEN
TEN
TEN



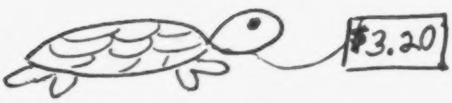


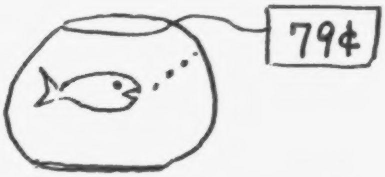
______ ANSWER

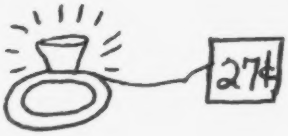
______ ANSWER

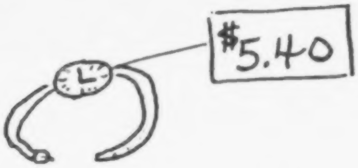
______ ANSWER

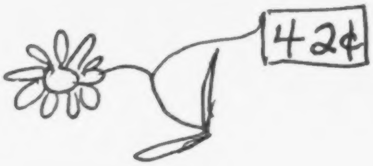
★★★ 5. DRAW A RED RING AROUND THE TOY THAT YOU CANNOT BUY WITH $5.00. DRAW BLUE RINGS AROUND THE TOYS THAT COST LESS THAN $1.00.

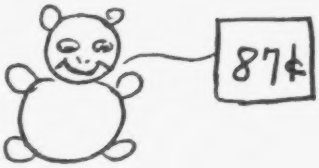


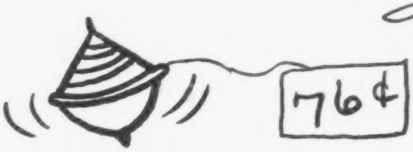








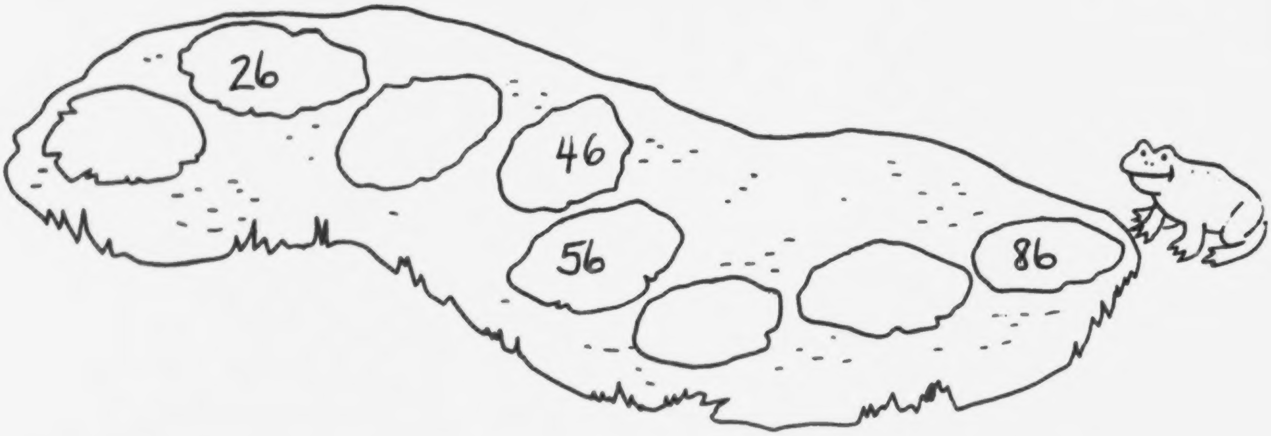




STAR PROBLEMS
GRADE 1, XXIII

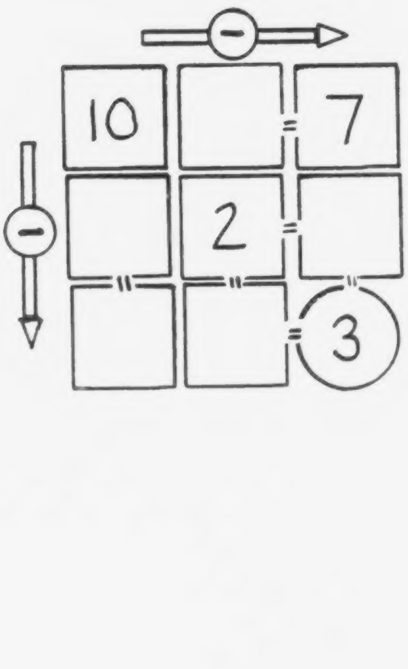
I DID THIS WORK MYSELF ______________

★★★ 1. HELP FREDA THE FROG HOP BACK ACROSS THE POND. FILL IN THE MISSING NUMBERS ON THE LILY PADS.



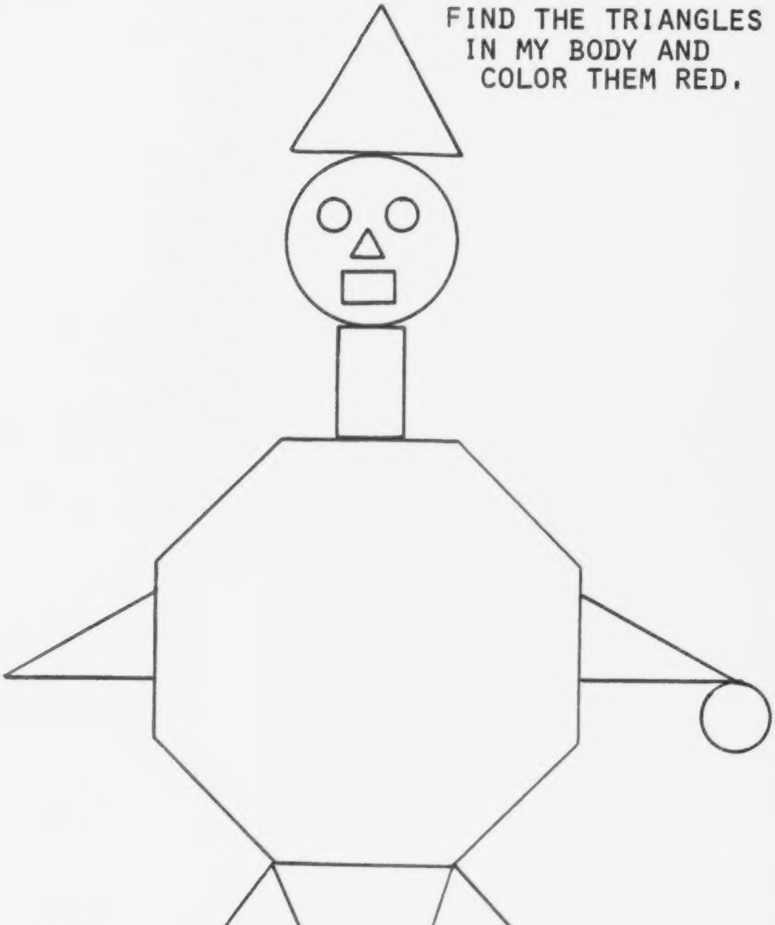
★★★★ 2. SUBTRACT ACROSS.
SUBTRACT DOWN.

FILL IN THE BOXES WITH THE MISSING NUMBERS.

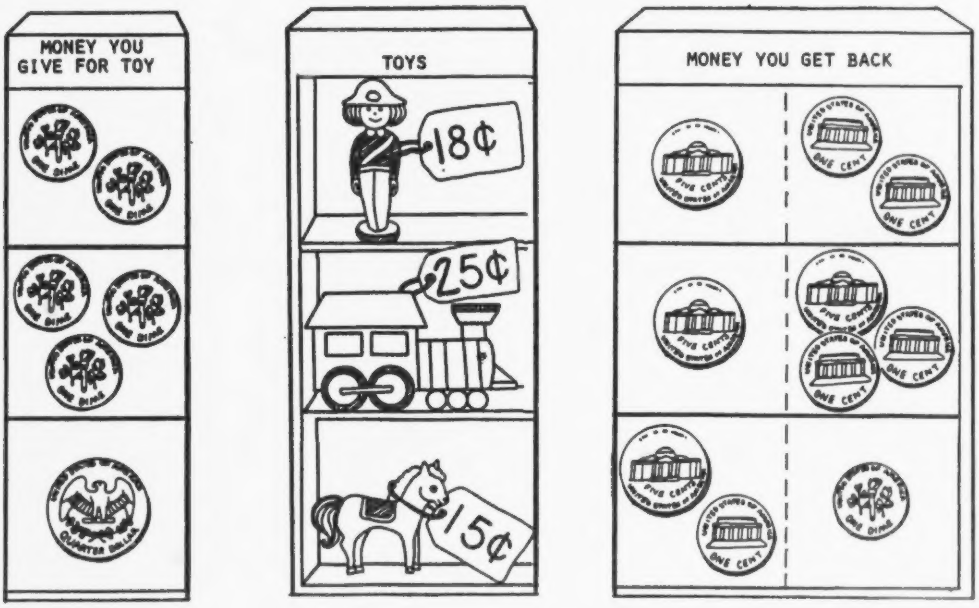


★ 3. I AM MR. SHAPO.

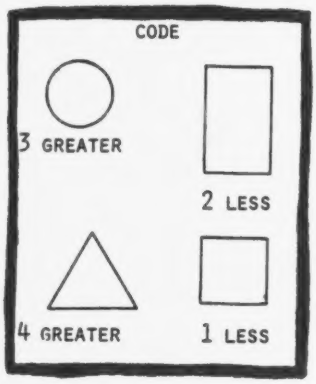
FIND THE TRIANGLES IN MY BODY AND COLOR THEM RED.

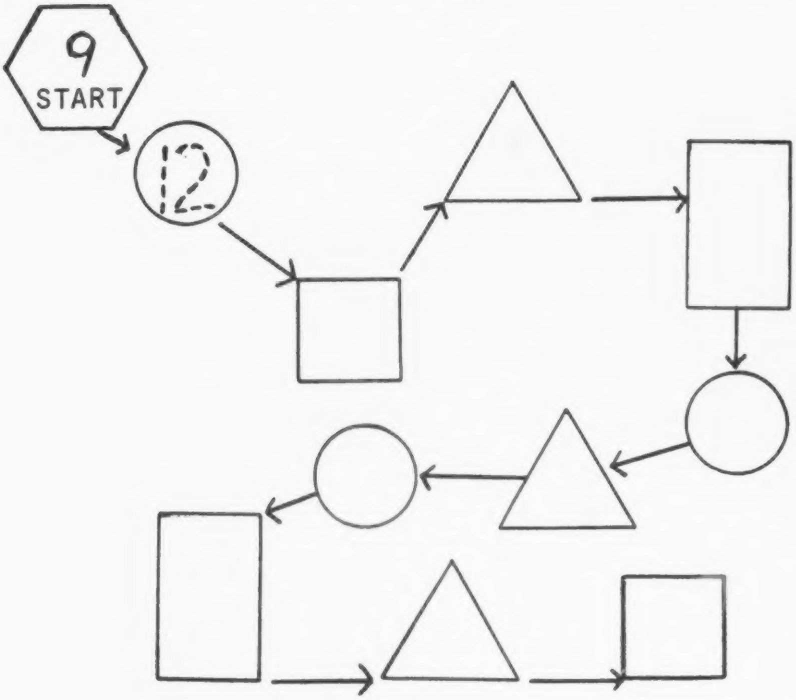


★★★ 4. USE THE MONEY SHOWN ON THE LEFT TO BUY THE TOYS ON THE SHELVES. THEN DRAW A CIRCLE AROUND THE MONEY YOU WILL GET BACK.


MONEY YOU GIVE FOR TOY
TOYS
MONEY YOU GET BACK
18¢
25¢
15¢
ONE DIME
QUARTER DOLLAR
FIVE CENTS
ONE CENT

★★★★ 5. USE THE CODE TO COMPLETE THE PATH. WRITE THE NUMBERS IN EACH SHAPE.


CODE
3 GREATER
2 LESS
4 GREATER
1 LESS



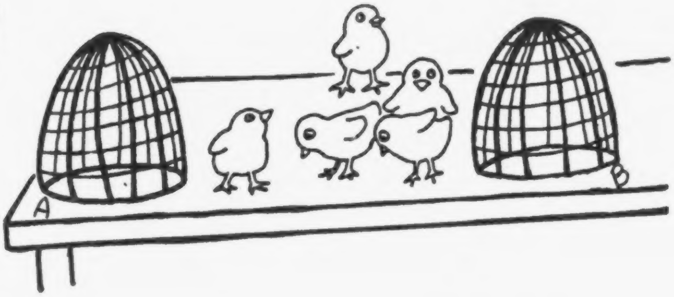
STAR PROBLEMS
GRADE 1, XXIV

I DID THIS WORK MYSELF: ________

★★★★ 1. HOW MANY WAYS ARE THERE TO PUT 5 BIRDS INTO 2 CAGES?

ANSWER: ____ WAYS

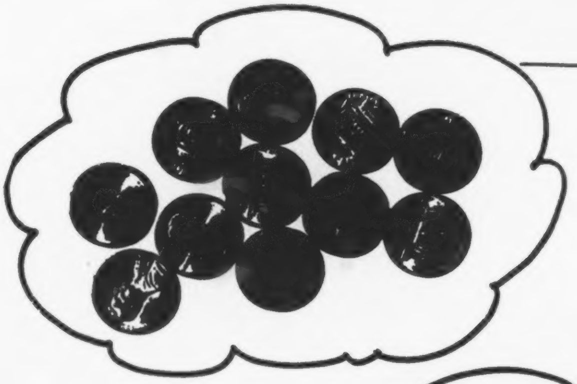
HINT: MAKE A CHART!



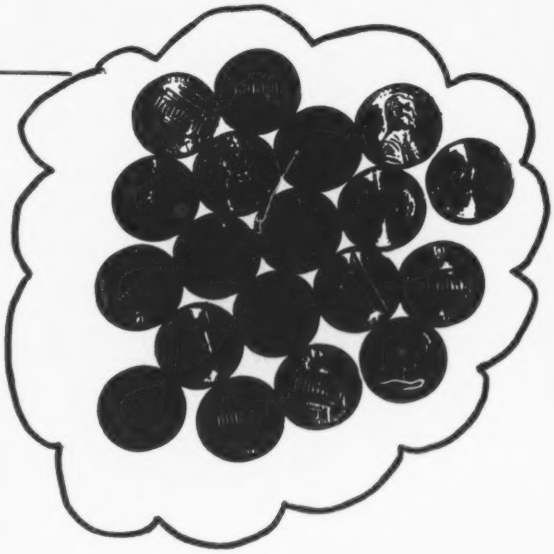
★★★ 2. A GROUP OF PENNIES IS CALLED EVEN IF YOU AND A FRIEND CAN DIVIDE THE GROUP EQUALLY, WITH NO PENNIES LEFT OVER. IF A PENNY IS LEFT OVER WHEN YOU DIVIDE THE GROUP, THAT GROUP IS CALLED ODD.

WRITE EVEN OR ODD BESIDE EACH GROUP OF PENNIES BELOW.

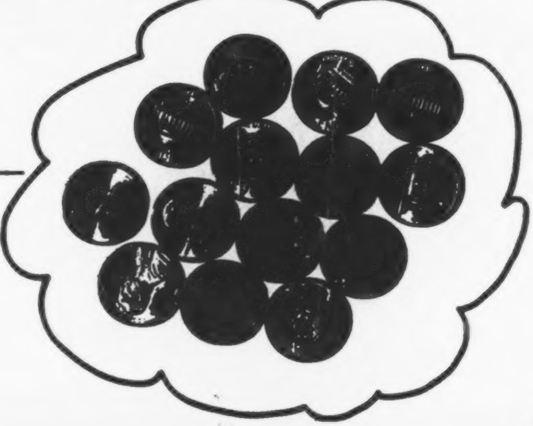
____



____

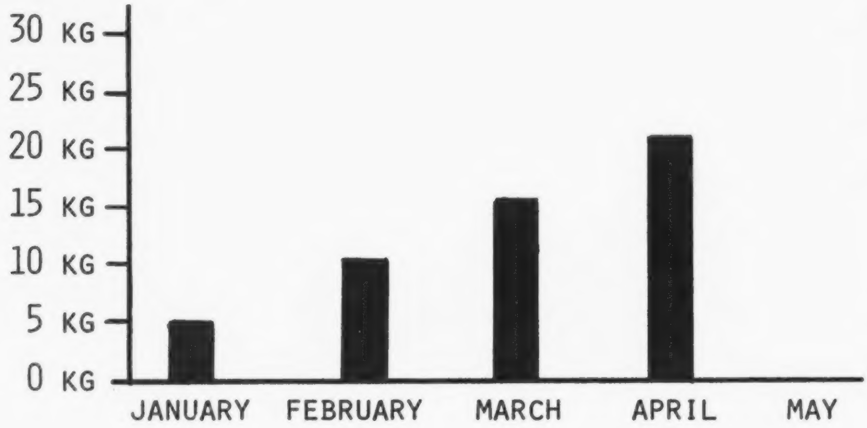


____



★ 3. WRITE THE MISSING NUMBER IN THE SQUARE: $12 - \square = 5$

★★★★ 4. JANICE KEPT UP WITH HER NEW PUPPY'S WEIGHT ON THE CHART BELOW. HER PUPPY WAS BORN IN JANUARY.



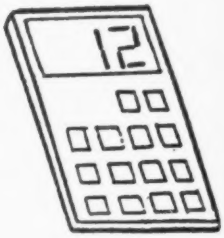
IF THE PUPPY KEPT GROWING JUST AS FAST DURING MAY, HOW MUCH WOULD HE WEIGH? FINISH THE BAR GRAPH FOR YOUR ANSWER.

★★ 5. MARY ADDED \$5.00 AND \$7.00 ON HER NEW CALCULATOR, AND GOT THE ANSWER SHOWN TO THE RIGHT. CIRCLE THE SENTENCE BELOW THAT MAKES THE MOST SENSE.

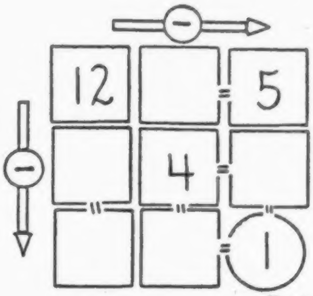
(A) MARY'S CALCULATOR IS PROBABLY BROKEN.

(B) MARY'S CALCULATOR NEEDS A NEW BATTERY PROBABLY.

(C) MARY'S CALCULATOR IS WORKING FINE.



★★★ 6. SUBTRACT ACROSS AND SUBTRACT DOWN. FILL IN THE BOXES WITH THE MISSING NUMBERS.



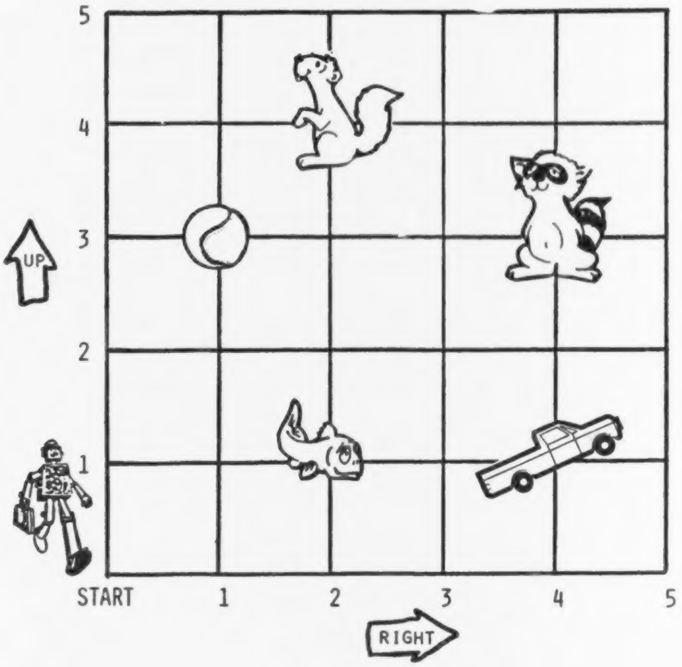
STAR PROBLEMS
GRADE 1, XXV

I DID THIS WORK MYSELF: ____________

★★★ 1. MARY'S CAT HAD 6 KITTENS, AND HER DOG HAD 5 PUPPIES. SHE GAVE AWAY 4 KITTENS AND 2 PUPPIES. HOW MANY ANIMALS DID SHE HAVE LEFT AT HOME TO PLAY WITH?

ANSWER: ____ ANIMALS

★★★★ 2. TELL THE ROBOT HOW TO FIND EACH OF THE THINGS ON THE MAP. TELL THE ROBOT HOW FAR TO THE RIGHT FIRST, AND THEN HOW FAR UP TO GO.



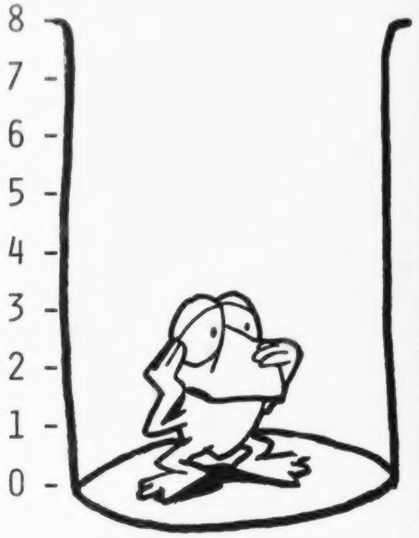
TO GET TO THE:	GO RIGHT:	GO UP:
SQUIRREL	2	4
BASEBALL		
RACCOON		
FISH		
TRUCK		

★★ 3. AFTER GOING TRICK-OR-TREATING AT HALLOWEEN, YOU HAD 5 ORANGE LOLLIPOPS, 3 GRAPE LOLLIPOPS, AND 9 CHERRY LOLLIPOPS. IF YOU PUT THEM IN THE SAME SACK, AND PICKED ONE OUT WITHOUT LOOKING, WHAT KIND OF LOLLIPOP WOULD IT PROBABLY BE?

ANSWER: IT WOULD PROBABLY BE ______.

★★★★4. A FROG FELL IN A WELL, AND WAS SCARED. EVERY DAY THE FROG WOULD CLIMB UP 2 FEET, BUT AT NIGHT HE WOULD SLIDE BACKWARDS 1 FOOT. DRAW A DIAGRAM OF HIS TRIP ON THE WELL WALL, AND FIND OUT HOW MANY DAYS IT TOOK HIM TO GET OUT OF THE WELL.

ANSWER: IT TOOK ____ DAYS
FOR THE FROG TO GET OUT.



5. IN THE CHART BELOW, EACH ⚾ STANDS FOR 2 GAMES WON BY THE TEAM.

PIRATES	⚾⚾⚾
BEARS	⚾
TIGERS	⚾⚾⚾⚾
RED SOX	⚾⚾

★ HOW MANY GAMES DID THE BEARS WIN? ____

★ HOW MANY GAMES DID THE RED SOX WIN? ____

★★ HOW MANY MORE GAMES DID THE TIGERS WIN THAN THE PIRATES? ____

WORKSHEETS
FOR
GRADE 2

STAR PROBLEMS
GRADE 2, I

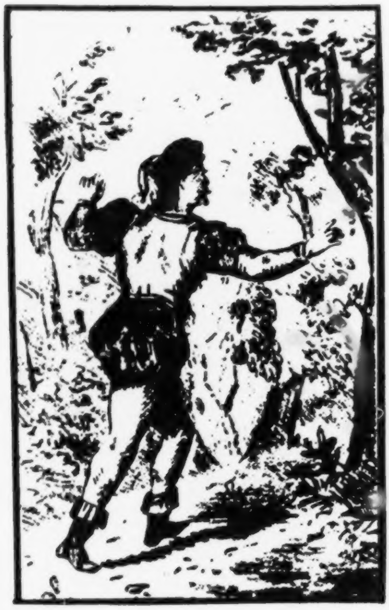
I DID THIS WORK MYSELF: ____________

★★★★ 1. WHEN JULIO COUNTS HIS PENNIES, HE LIKES TO MAKE 2 PILES THAT ARE THE SAME HEIGHT. HE KNOWS HE HAS AN EVEN NUMBER TO START WITH, IF HE CAN MAKE THE PILES THE SAME HEIGHT. IF HE CAN'T, HE HAS AN ODD NUMBER OF PENNIES.

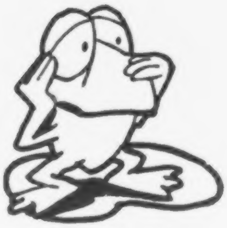
WRITE EVEN OR ODD BESIDE EACH GROUP OF PENNIES BELOW, USING JULIO'S METHOD.

NUMBER OF PENNIES:	EVEN OR ODD?
14	________
15	________
16	________
17	________
22	________
25	________

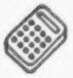
★ 2. A LADY'S FACE IS HIDDEN IN THIS PICTURE SOMEWHERE. COLOR HER FACE RED.



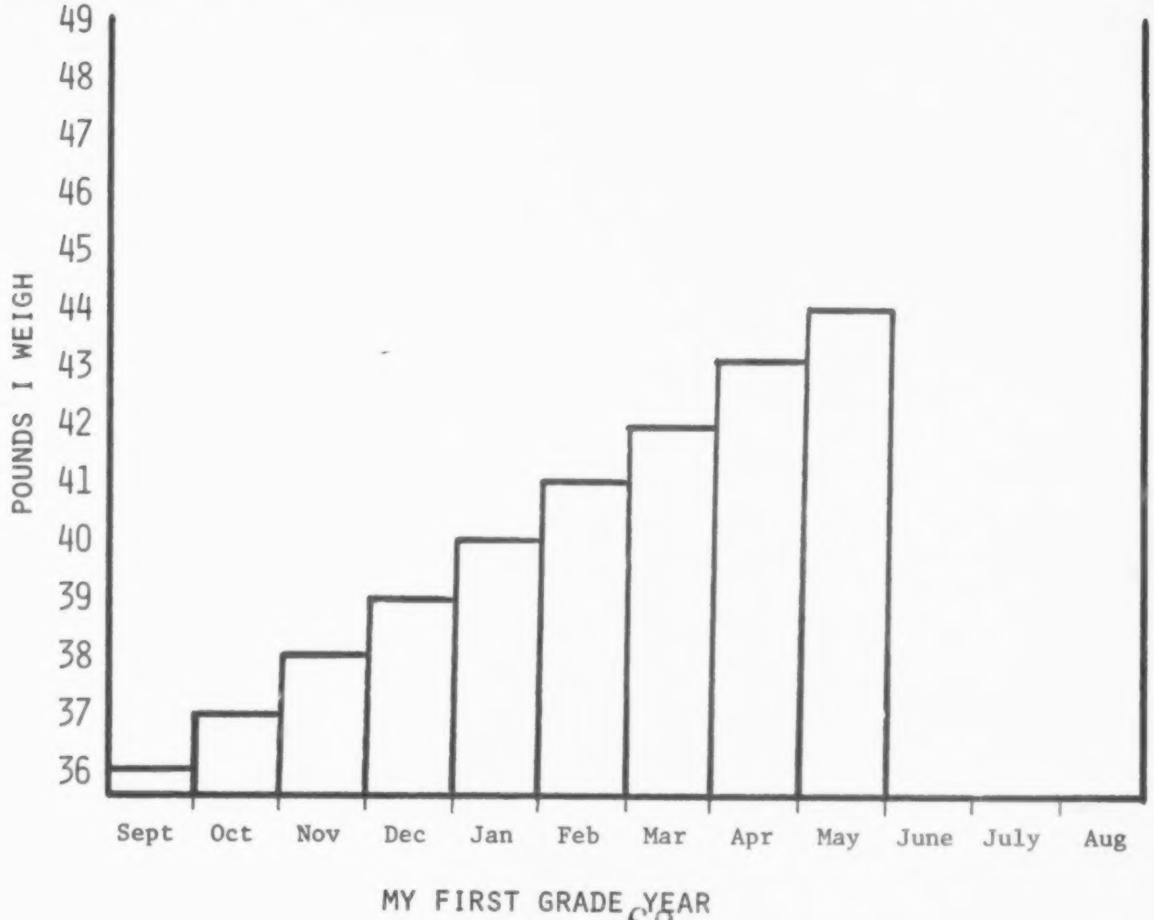
★★ 3. ALL INSECTS HAVE 6 LEGS, AND ALL FROGS HAVE 4 LEGS. IF MAX CAUGHT 2 INSECTS AND 2 FROGS, HOW MANY LEGS WOULD THERE BE ON ALL THOSE CREATURES?



ANSWER: ___ LEGS

★ 4. USE A  : 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = ____

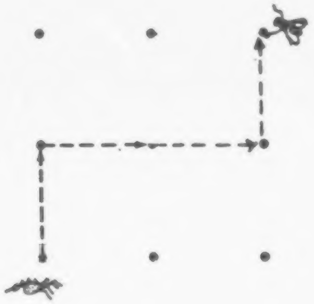
★★★ 5. WHEN JANET WAS IN THE FIRST GRADE, SHE KEPT UP WITH HER WEIGHT ON THE CHART BELOW. IF SHE KEPT GROWING OVER THE SUMMER JUST LIKE SHE DID BEFORE, DRAW IN THE BARS ON THE GRAPH BELOW FOR THE LAST THREE MONTHS.



STAR PROBLEMS
GRADE 2, II

I DID THIS WORK MYSELF: ___________

★★★★ 1. THE SPIDER CAN ONLY MOVE UP OR ACROSS TO GET TO THE FLY. ONE OF HIS PATHS IS SHOWN. HOW MANY PATHS ALTOGETHER ARE THERE FOR THE SPIDER TO GET HIS MEAL?



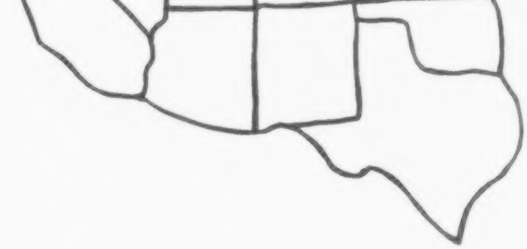
ANSWER: THERE ARE ___ PATHS.

★★★ 2. DO THESE PROBLEMS ON YOUR CALCULATOR, AND WRITE THE ANSWER ON THE LINE BESIDE THE PROBLEM:

(A) 27 + 54 + 75 + 403 = _____

(B) 385 - 76 + 541 = _____

(c) 372
54 = _____
+846



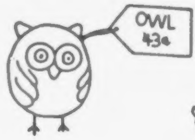
★★★★ 3. COLOR THE MAP TO THE LEFT USING ONLY 4 COLORS. NO STATE CAN BE THE SAME COLOR AS ONE THAT TOUCHES IT.

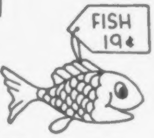
HINT: YOU CAN USE THIS CODE INSTEAD OF REAL COLORS, IF YOU WANT TO:

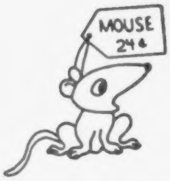
R = RED
G = GREEN
B = BLUE
Y = YELLOW

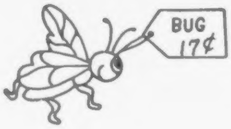
★★ 4. MARIA LOST A TOOTH, BUT GOT 25¢ FROM THE TOOTH-FAIRY THAT NIGHT. THE NEXT DAY SHE BOUGHT ONE OF THESE ANIMALS, AND GOT 2 COINS BACK AS HER CHANGE. WHICH ANIMAL DID SHE BUY?

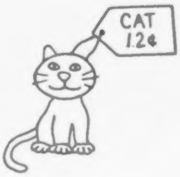
ANSWER: ______











★ 5. JOSÉ WANTED TO INVITE 15 FRIENDS TO HIS BIRTHDAY PARTY. HE HAD THE RIGHT NUMBER OF INVITATIONS AND ENVELOPES, BUT HE ONLY HAD 8 STAMPS. DRAW A PICTURE OF THE 15 ENVELOPES, WITH STAMPS ON 8 OF THEM, IN THE CORRECT CORNER OF THE ENVELOPE.

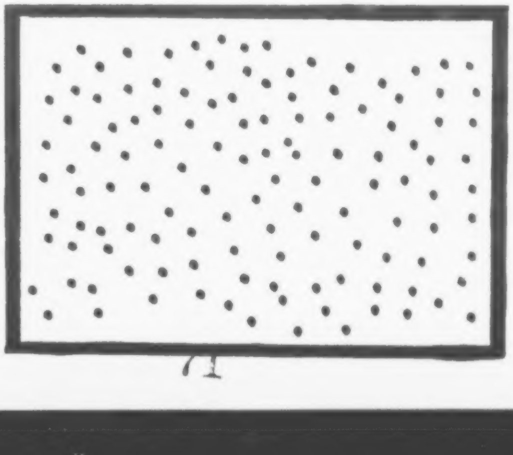
PICTURE:

★ 6. LOOK AT YOUR PICTURE ABOVE. HOW MANY MORE STAMPS DID JOSÉ NEED TO BUY?

ANSWER: JOSÉ NEEDED TO BUY ____ MORE STAMPS.

★ 7. COUNT THE DOTS:

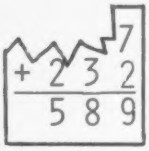
ANSWER: __ DOTS

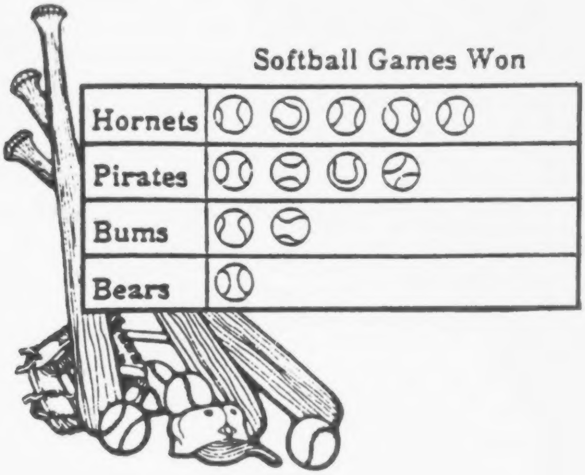


STAR PROBLEMS
GRADE 2, III

I DID THIS WORK MYSELF: ____________

★★ 1. FIND THE MISSING NUMBERS THAT WERE TORN OFF. WRITE THEM IN THE CORRECT PLACE.




Softball Games Won

Hornets	⚾ ⚾ ⚾ ⚾ ⚾
Pirates	⚾ ⚾ ⚾ ⚾
Bums	⚾ ⚾
Bears	⚾

★ 2. HOW MANY MORE GAMES DID THE HORNETS WIN THAN THE BEARS?

__ GAMES

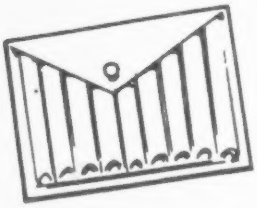
★ 3. WHICH TEAM WON EXACTLY 2 GAMES MORE THAN ANOTHER TEAM?

____

★★★ 4. "EVEN OUT" THE 12 WINS SO THAT EACH TEAM HAS THE SAME NUMBER OF WINS AS THE OTHER TEAMS. HOW MANY WINS WOULD EACH TEAM HAVE?

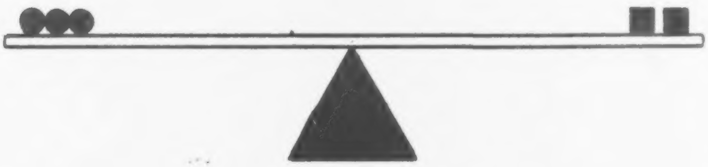
___ WINS

★★★★ 5. THERE ARE 9 MARKERS IN ONE BOX. IF YOU HAD TO GIVE ONE MARKER TO EACH OF THE 25 STUDENTS IN YOUR CLASS, HOW MANY BOXES WOULD YOU HAVE TO BUY? ANSWER: ___ BOXES

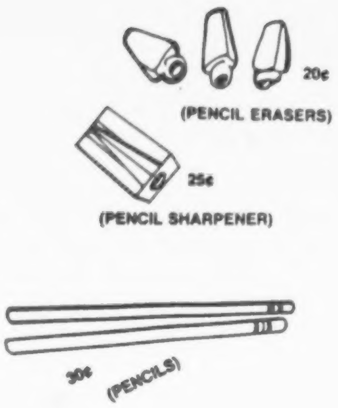


★★★ 6. WHICH WEIGHS THE MOST, 1 ■ OR 1 ● ?

ANSWER: ____ WEIGHS THE MOST.



★★ 7. WHILE SHOPPING WITH DAD, YOU BUY A PENCIL SHARPENER FOR 25¢, PENCILS FOR 30¢, AND ERASERS FOR 20¢. CIRCLE THE AMOUNT OF TAX YOU WILL HAVE TO PAY FOR YOUR ITEMS, ON THE CHART TO THE RIGHT.


20¢
(PENCIL ERASERS)
25¢
(PENCIL SHARPENER)
30¢
(PENCILS)

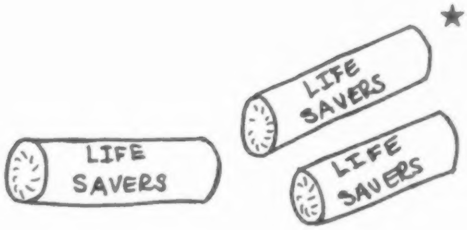
Sale	Tax
$.01- .10	$.00
.11- .27	.01
.28- .47	.02
.48- .68	.03
.69- .89	.04
.90-1.09	.05
1.10-1.29	.06
1.30-1.49	.07
1.50-1.69	.08
1.70-1.89	.09

★★★ 8. 19 IS A TWO-DIGIT NUMBER WHOSE DIGIT-SUM IS 10, SINCE 1 + 9 = 10. HOW MANY OTHER TWO-DIGIT NUMBERS HAVE A DIGIT-SUM OF 10?

ANSWER: ___

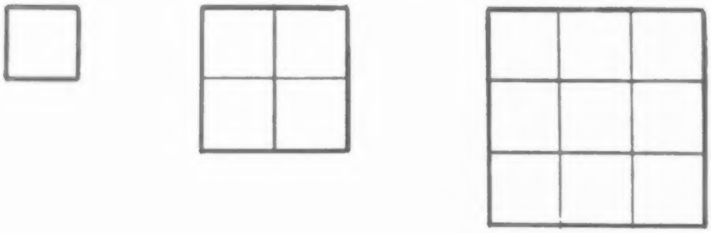
Hint: make a list

★★ 9. EACH OF YOUR THREE PACKAGES OF LIFE SAVERS HAS 8 PIECES OF CANDY IN IT, AND COSTS 35¢. IF YOU SHARE YOUR CANDY EQUALLY WITH A FRIEND, HOW MANY PIECES WILL YOU GET?


LIFE SAVERS
LIFE SAVERS
LIFE SAVERS

ANSWER: I'LL GET __ PIECES.

★★ 10. DRAW THE NEXT SHAPE FOR THE PATTERN SHOWN BELOW.



STAR PROBLEMS
GRADE 2, IV

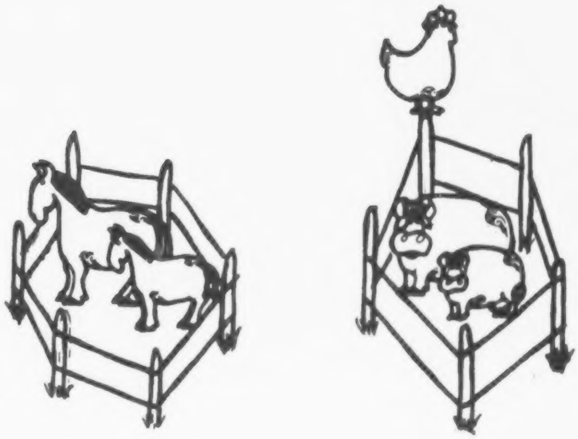
I DID THIS WORK MYSELF: ____________

★★★ 1. SOME FARM ANIMALS ARE SHOWN TO THE RIGHT.

HOW MANY LEGS ARE ON ALL THE ANIMALS TOGETHER? ___LEGS

HOW MANY EARS ARE THERE ON ALL THE ANIMALS? ___EARS

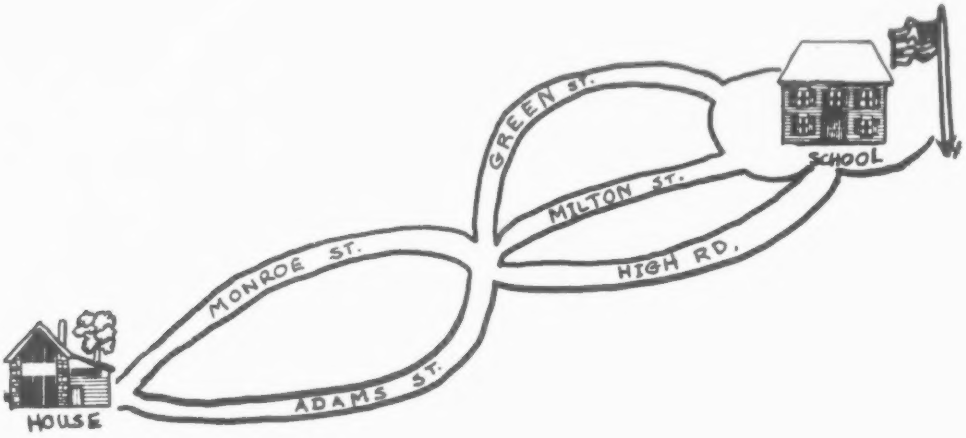
HOW MANY MORE LEGS ARE THERE, THAN EARS? __ MORE LEGS



★★ 2. IF A SCHOOL LUNCH COSTS YOU 55¢, ABOUT HOW MUCH WILL YOU HAVE TO PAY TO EAT AT SCHOOL FOR A WHOLE WEEK? BUBBLE-IN THE BEST CHOICE.

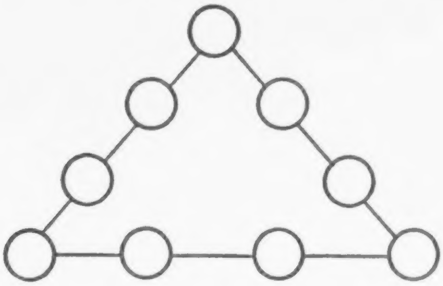
○ \$1 ○ \$2 ○ \$3 ○ \$4

★★★★ 3. HOW MANY DIFFERENT WAYS CAN MARY GET FROM HER HOUSE TO SCHOOL?
(HINT: MAKE A LIST, STARTING WITH "MONROE ST., GREEN ST.")

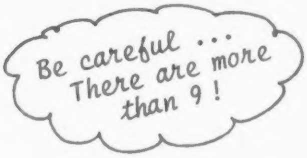

SCHOOL
GREEN ST.
MILTON ST.
HIGH RD.
MONROE ST.
ADAMS ST.
HOUSE

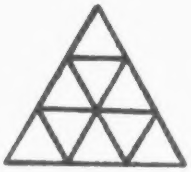
ANSWER: THERE ARE _____ WAYS FOR MARY TO GET THERE.

★★★★4. PLACE THE DIGITS FROM 1 TO 9 INSIDE THE CIRCLES SO THAT THE SUM WILL BE 20 ALONG EACH SIDE. USE EACH DIGIT ONCE.



★★★ 5. COUNT ALL THE TRIANGLES YOU CAN FIND IN THE FIGURE BELOW. HOW MANY ARE THERE?


Be careful ...
There are more
than 9 !



ANSWER: ___

★★★ 6. THE CHART BELOW SHOWS MARTIN'S AFTERNOON SCHEDULE FOR THIS WEEK. USE IT TO ANSWER THE QUESTIONS.

start time →	12:00	1:00PM	2:00PM
MONDAY	MUSIC	MATH	LIBRARY
TUESDAY	P.E.	ART	HEALTH
WEDNESDAY	MUSIC	MATH	LIBRARY
THURSDAY	P.E.	MOVIE	HEALTH
FRIDAY	SCIENCE	MATH	RECESS

QUESTIONS:

ON WHAT DAYS DOES MARTIN HAVE P. E.? ____________

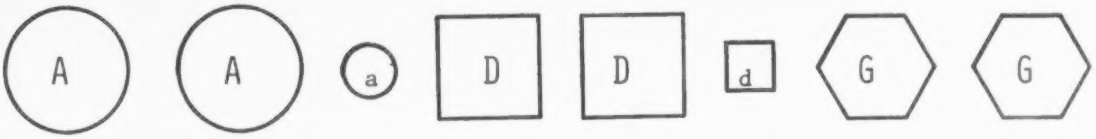
HOW MANY AFTERNOON HOURS WILL HE SPEND DOING MATH? ___

GIVE THE DAY AND TIME THAT HE WILL GET TO WATCH A MOVIE: ________ FROM ____ O'CLOCK TILL ____ O'CLOCK

STAR PROBLEMS
GRADE 2 , V

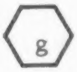
I DID THIS WORK MYSELF: ____________________

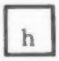
★★ 1.

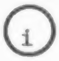


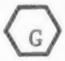
____

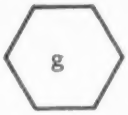
LOOK AT THE SHAPES. PUT AN X ON THE SHAPE BELOW THAT GOES IN THE BLANK.



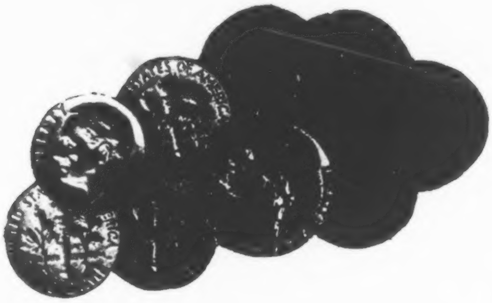


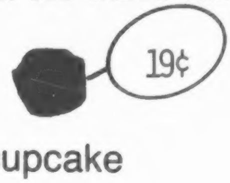


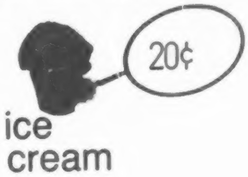




★★ 2. JANE HAS 49¢. SHE BOUGHT A CUPCAKE AND AN ICE-CREAM. HOW MUCH DID SHE HAVE LEFT?







ANSWER ____________________¢

★★★★ 3. I AM THINKING OF TWO NUMBERS.

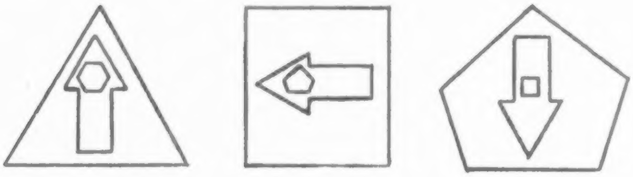
WHEN YOU ADD THE TWO NUMBERS, THE SUM IS 28.

WHEN YOU SUBTRACT THE TWO NUMBERS, THE DIFFERENCE IS 6.

WHAT ARE THE TWO NUMBERS?

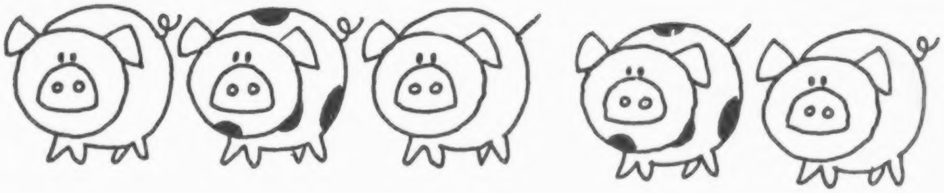
ANSWER ________ ________

★★★★ 4. DRAW THE NEXT SHAPE IN THE PATTERN:



____

★ 5. LOOK AT THE PIGS CAREFULLY.

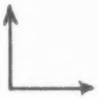


(EXAMPLE) __2__ OUT OF __5__ PIGS HAVE STRAIGHT TAILS.

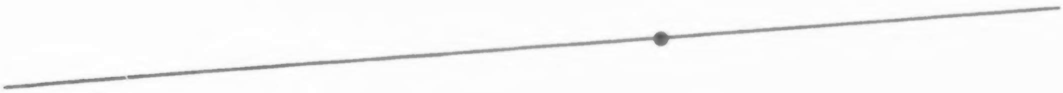
FILL IN THE BLANKS.

________ OUT OF ________ PIGS HAVE SPOTS.

________ OUT OF ________ PIGS HAVE CURLY TAILS.

★★★ 6. THIS IS A RIGHT ANGLE: 

FOLD THIS PAPER SO THAT YOU MAKE A RIGHT ANGLE AT THE POINT ON THE LINE SEGMENT BELOW.



★★★★ 7. PRACTICE SUBTRACTING ON THESE PROBLEMS, USING YOUR HEAD INSTEAD OF YOUR PENCIL. YOU'LL BE GIVEN A PROBLEM LIKE THESE WHEN YOU TURN IN YOUR PAPER. YOU'LL HAVE TO DO IT CORRECTLY, IN YOUR HEAD, TO EARN YOUR STARS.

132	254	346	450	643	730
-99	-98	-99	-198	-390	-95

Hint: Think of taking 100 from 133.

ANSWER FOR PROBLEM LATER: ☐

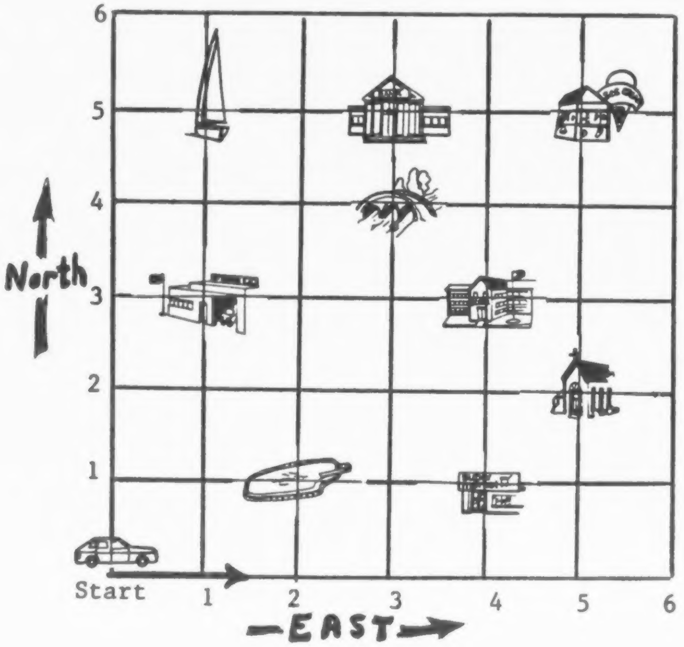
STAR PROBLEMS
GRADE 2, VI

I DID THIS WORK MYSELF: ____________

★★★ 1. THE TAXI MOVES FROM "START" TO ANOTHER POINT BY GOING EAST FIRST, AND THEN NORTH. IT GETS TO THE BOAT BY GOING 1 BLOCK EAST, AND THEN 5 BLOCKS NORTH. FOLLOW THE TAXI'S PATH WITH YOUR FINGER.

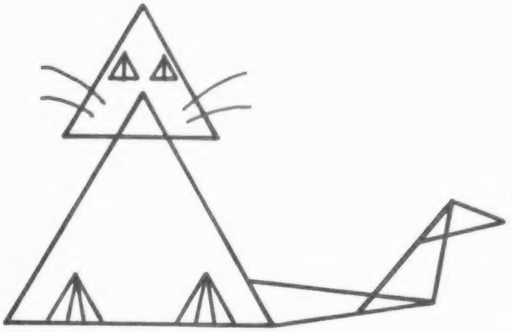
THE TAXI DRIVER'S SECRET CODE FOR THE BOAT IS (1, 5). WRITE THE SECRET CODE FOR THESE PLACES:

boat (1, 5)
church (__, __)
pool (__, __)
bridge (__, __)


6
5
4
3
2
1
North
Start
1
2
3
4
5
6
EAST

★★★★ 2. HOW MANY TRIANGLES ARE IN THE CAT PICTURE?

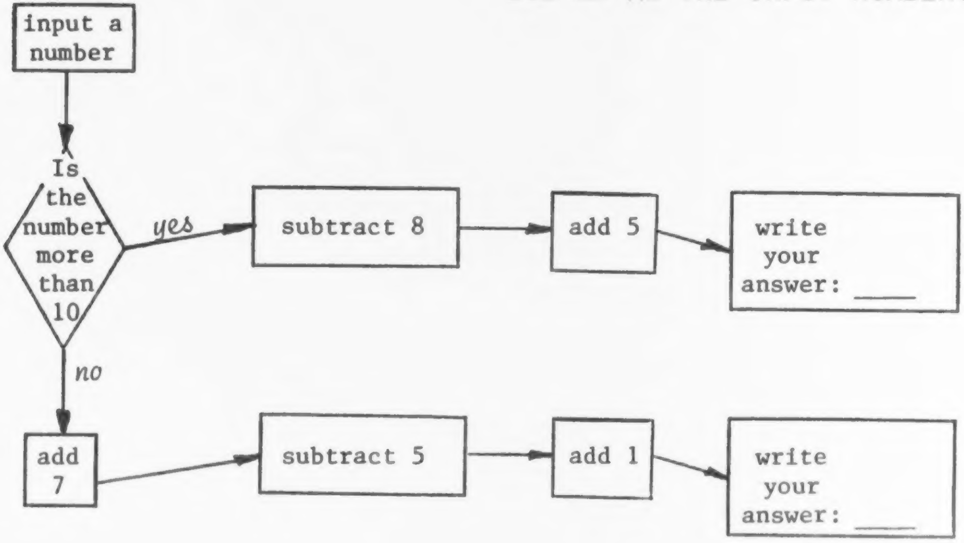
ANSWER: ___ TRIANGLES


Be careful ... There's more than 25 !

★★ 3. FIND THE NUMBERS THAT GO IN THE BOXES.

$$\begin{array}{r} 3\boxed{}5 \\ -\ 4\boxed{} \\ \hline \boxed{}22 \end{array}$$

★★★★ 4. FOLLOW THE FLOWCHART. START WITH 8 AS THE FIRST INPUT NUMBER. NEXT USE 15 AS THE INPUT NUMBER.


input a number
Is the number more than 10
yes
subtract 8
add 5
write your answer: ____
no
add 7
subtract 5
add 1
write your answer: ____

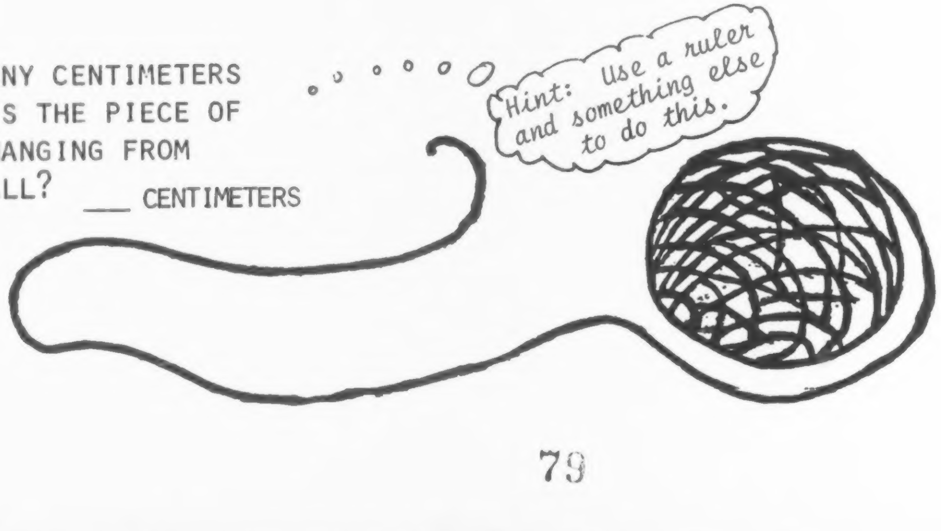
★ 5. LOOK AT THE CALENDAR. IF TODAY IS JANUARY 21, HOW MANY SUNDAYS HAVE PASSED IN THIS MONTH?

JANUARY

ANSWER: ____ SUNDAYS

S	M	T	W	Th	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

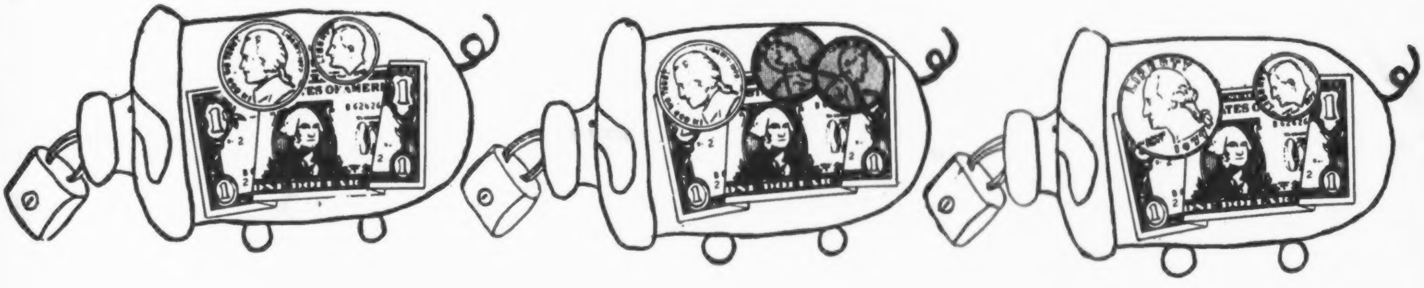
★★ 6. HOW MANY CENTIMETERS LONG IS THE PIECE OF YARN HANGING FROM THE BALL? ___ CENTIMETERS


Hint: Use a ruler and something else to do this.

STAR PROBLEMS
GRADE 2, VII

I HAVE DONE THIS WORK MYSELF: __________

★★ 1. DRAW A CIRCLE AROUND THE BANK WITH THE MOST MONEY. PUT A BIG "X" ON THE BANK WITH THE LEAST MONEY.



★★ 2. HOW MUCH MONEY IS THERE IN ALL THREE BANKS TOGETHER? $______

★ 3. MOM HAD 25 COOKIES. SHE ATE 2 COOKIES, FREDERICK ATE 6, ANDY ATE 5, AND DAD ATE 6. HOW MANY COOKIES WERE EATEN?

ANSWER: ___ COOKIES

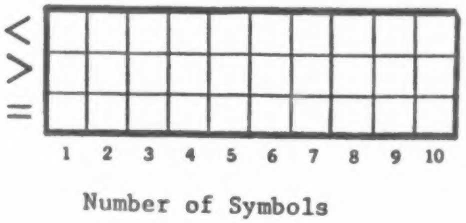
★★★★ 4. SOLVE THE PROBLEMS BELOW BY PUTTING >, <, OR = IN EACH ○. MAKE A BAR GRAPH AS YOU GO, TO SHOW HOW MANY OF EACH SYMBOL YOU USE IN THE PROBLEMS.

HINT: > MEANS "IS GREATER THAN"
< MEANS "IS LESS THAN"

PROBLEMS

1. 27 ○ 29
2. 146 ○ 150
3. 3+9 ○ 10+2
4. 41+8 ○ 50-1
5. 79-2 ○ 80-11
6. 65+25 ○ 100-12
7. 534 ○ 543
8. 3+3+3 ○ 5+3

GRAPH



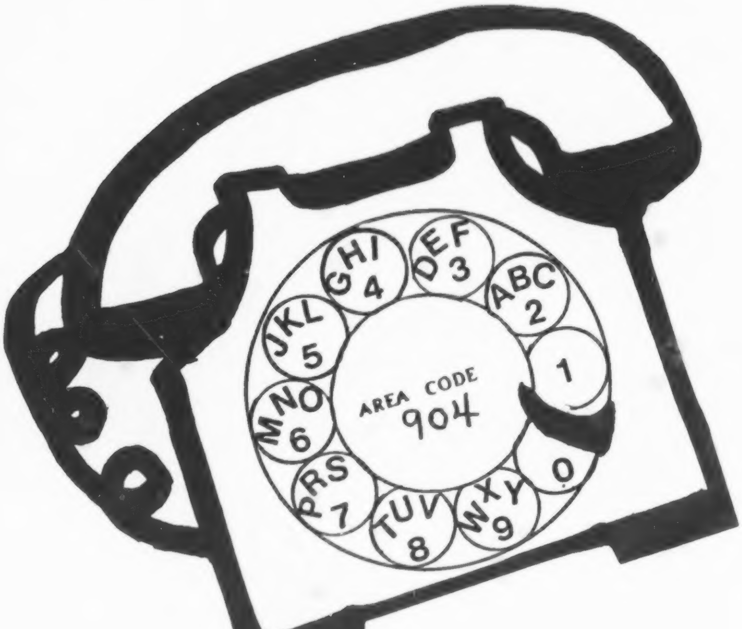
★ 5. THIS PIECE OF PAPER IS 8½ INCHES WIDE. USE THIS INFORMATION TO ESTIMATE THE LENGTH OF THE PENCIL BELOW. CIRCLE THE BEST ESTIMATE.

ANSWER: (A) 7 INCHES (B) 10 INCHES (C) 4 INCHES

★★★ 6. USE THE TELEPHONE BELOW TO FIND THE VALUE OF THE WORDS LISTED. ADD THE NUMBERS TO FIND THE VALUE.

EXAMPLE: F L O W E R = 33
3 5 6 9 3 7

(3+5+6+9+3+7 = 33)


GHI
4
DEF
3
ABC
2
JKL
5
1
AREA CODE
904
MNO
6
0
PRS
7
TUV
8
WXY
9

WORDS TO USE:

LAKE: ________________ = ____

BRUSH: ________________ = ____

FATHER: ________________ = ____

PUPPY: ________________ = ____

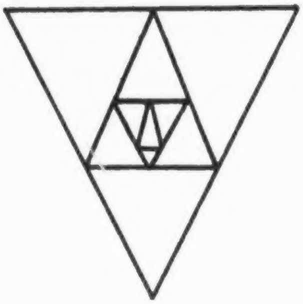
CHAIN: ________________ = ____

STAR PROBLEMS

I HAVE DONE THIS WORK MYSELF: __________

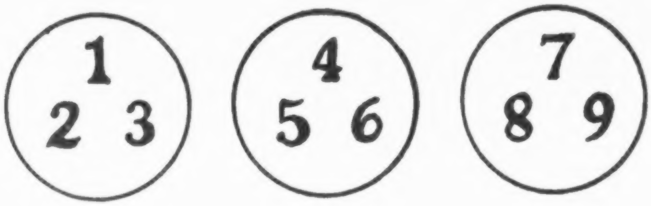
GRADE 2, VIII

★★ 1. HOW MANY DIFFERENT TRIANGLES CAN YOU FIND IN THE FIGURE BELOW?

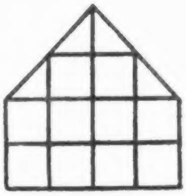


ANSWER:______

★★ 2. CROSS OUT ONE NUMBER IN A CIRCLE AND MOVE IT TO ANOTHER CIRCLE, SO THAT THE SUM OF THE DIGITS IN EACH CIRCLE WILL BE EQUAL.



★★ 3. THE AREA OF A FIGURE IS THE NUMBER OF UNIT SQUARES IT WOULD TAKE TO MAKE THE FIGURE. WHAT IS THE AREA OF THE FIGURE BELOW, USING ☐ AS THE UNIT SQUARE?



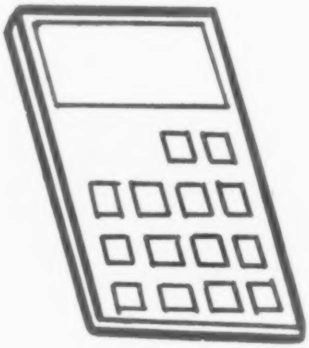
ANSWER: __ ☐'S

HINT: DON'T FORGET TO COUNT THE HALF SQUARES TOO!

★★ 4. USE THREE 3'S TO MAKE A NUMBER GREATER THAN 200.

ANSWER: ______

★ 5. MARK WANTED TO ADD $18 AND $75 ON HIS CALCULATOR. WHICH OF THESE KEYS WOULD NOT APPEAR ON HIS CALCULATOR? (CIRCLE YOUR ANSWER.)



A. $\boxed{7}$

B. $\boxed{8}$

C. $\boxed{+}$

D. $\boxed{\$}$

★★★ 6.

THE AREA OF SOMETHING IS THE NUMBER OF SQUARES IT TAKES TO COVER IT UP. THE LINES AROUND THESE WORDS MAKE A

SQUARE DECIMETER

ESTIMATE THE AREA OF THIS WHOLE SHEET OF PAPER, IN SQUARE DECIMETERS.

ANSWER: THIS SHEET OF PAPER IS ABOUT ___ SQUARE DECIMETERS. (PUT EITHER 3, 6, OR 9 ON THE LINE AS YOUR ANSWER.)

★★★ 7. PUT THE RIGHT NUMBER IN THE BOXES TO MAKE TRUE STATEMENTS:

$46 - \square = 23$ $18 + \square = 30$ $\square - 14 = 24$

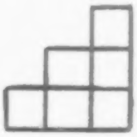
STAR PROBLEMS
GRADE 2, IX

I DID THIS WORK MYSELF: ___________

★★ 1. SANDY NEEDED 25 APPLES TO MAKE SOME APPLE PIES. SHE HAD 12 RED RIPE APPLES AND 8 GREEN JUICY APPLES. HOW MANY MORE APPLES DID SHE NEED TO BUY FROM THE MARKET SO SHE COULD MAKE HER PIES?

ANSWER:____ APPLES

★★★ 2. BELOW ARE SOME STAIRS MADE OF CUBES. THE HIGHEST STEP IS 3 CUBES HIGH. IT TAKES 6 CUBES TO MAKE THESE STAIRS. HOW MANY CUBES WOULD IT TAKE TO MAKE STAIRS IF THE HIGHEST STEP WAS 5 CUBES HIGH?



ANSWER: ___ CUBES

★ 3.

DAILY BOOK CHART	
MONDAY	12
TUESDAY	15
WEDNESDAY	10
THURSDAY	21
FRIDAY	11

LOOK AT THE CHART. ON WHAT DAY WERE THE MOST BOOKS READ?

ANSWER: ___________

★ 4. AGAIN, LOOK AT THE CHART ABOVE. ON WHAT DAY WERE 11 BOOKS READ?

ANSWER: ________

★★★ 5. USE EACH NUMBER ONLY ONCE.
CROSS OUT THE NUMBER WHEN IT IS USED.

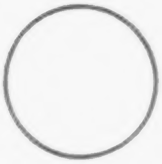
A) TWO NUMBERS WHOSE SUM IS 3
B) TWO NUMBERS WHOSE SUM IS 8
C) TWO NUMBERS WHOSE SUM IS 12
D) TWO NUMBERS WHOSE SUM IS 15

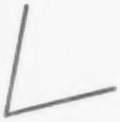
1	2	3
4	5	6
7	8	9

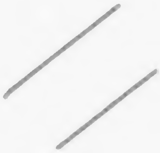
WHAT NUMBER IS LEFT?

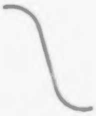
WRITE YOUR ANSWER IN THE ☐

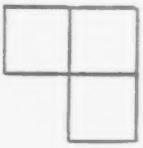
★6. DRAW A RING AROUND THE PICTURE OF AN ANGLE:



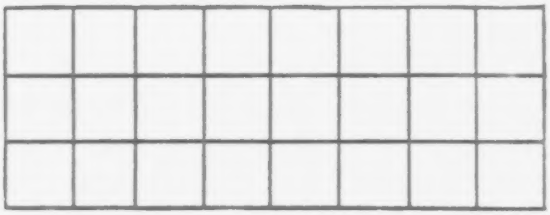






★★7. HOW MANY OF THESE  WOULD IT TAKE TO COVER THE GRID BELOW?

ANSWER: ___ 'S



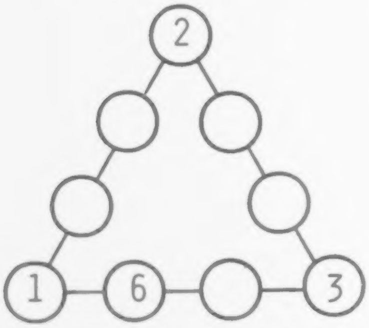
★★★ 8. PUT THE RIGHT DIGITS IN THE BOXES BELOW SO THE PROBLEMS WILL BE CORRECT.

$\begin{array}{r} 2\square \\ +35 \\ \hline 57 \end{array}$ $\begin{array}{r} \square 7 \\ -46 \\ \hline 21 \end{array}$ $\begin{array}{r} 83 \\ +1\square \\ \hline 99 \end{array}$ $\begin{array}{r} 58 \\ -\square 3 \\ \hline 4\square \end{array}$ $\begin{array}{r} 100 \\ +\square\square \\ \hline 137 \end{array}$

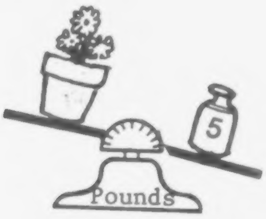
STAR PROBLEMS
GRADE 2, X

I DID THIS WORK MYSELF: ________

★★ 1. USING THE NUMBERS 1 - 9 ONLY ONCE, MAKE THE SUM ON EACH SIDE EQUAL 17 BY FILLING IN THE EMPTY CIRCLES.



★ 2. WHAT IS THE WEIGHT (MASS) OF THE FLOWER POT? CIRCLE THE BEST ANSWER.



A. 5 POUNDS

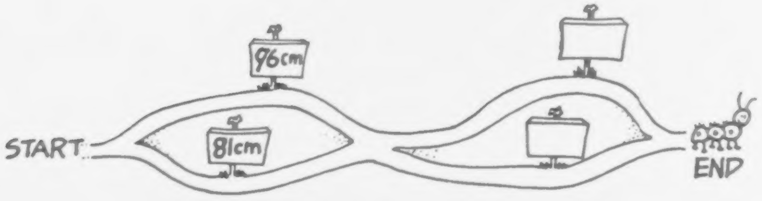
B. LESS THAN 5 POUNDS

C. MORE THAN 5 POUNDS

★★ 3. JAMES GETS UP AT 7:15 A.M. TO GET READY FOR SCHOOL. HE EATS BREAKFAST AT 7:45 A.M. WHAT TIME WILL HE EAT LUNCH IF HE WAITS 4 HOURS AFTER EATING BREAKFAST?

ANSWER: ______

★★★★ 4. ESTIMATE THE CENTIMETERS THE BUG TOOK IN ALL TO GET FROM "START" TO "END" IF THE BUG TOOK THE BOTTOM PATH. CIRCLE THE BEST ANSWER.

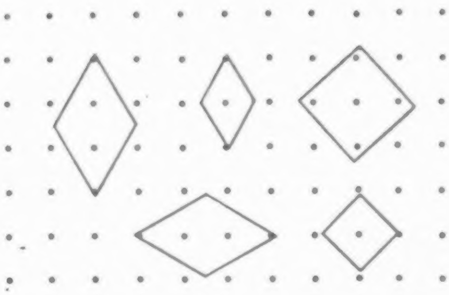


A. ABOUT 80 CM

B. ABOUT 160 CM

C. ABOUT 220 CM

★★ 5. COLOR THE CONGRUENT SHAPES BLUE.



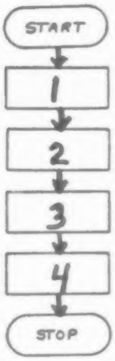
★★★ 6. PUT THESE DAILY STEPS IN THE RIGHT ORDER. NUMBER THEM 1, 2, 3, AND 4.

______GO TO BED

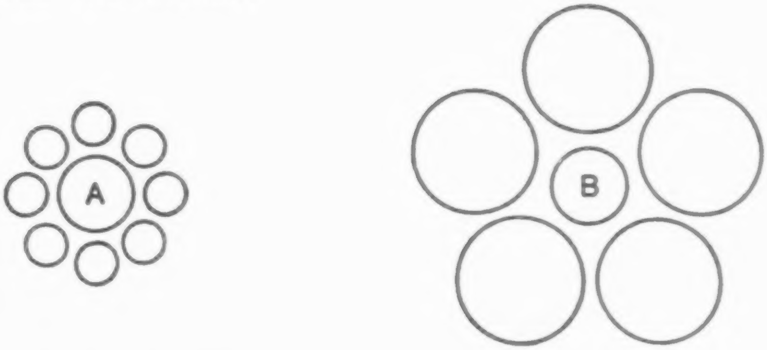
______GO TO SCHOOL

______GET UP

______GO HOME



★ 7. WHICH OF THE INNER CIRCLES BELOW IS THE LARGEST, A OR B? CIRCLE THE ANSWER.



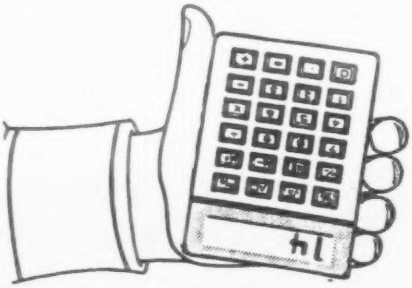
A IS LARGER

B IS LARGER

THEY ARE THE SAME SIZE.

★★ 8. JUDY WORKED A PROBLEM ON HER CALCULATOR. hl IS THE ANSWER SHE SAW WHEN SHE TURNED THE CALCULATOR UPSIDE DOWN. CIRCLE THE PROBLEM SHE WORKED.

A. $\begin{array}{r}14\\ \underline{-\ 4}\end{array}$ B. $\begin{array}{r}6\\ \underline{+\ 8}\end{array}$ C. $\begin{array}{r}7\\ \underline{+\ 4}\end{array}$ D. $\begin{array}{r}1\\ \underline{+\ 4}\end{array}$



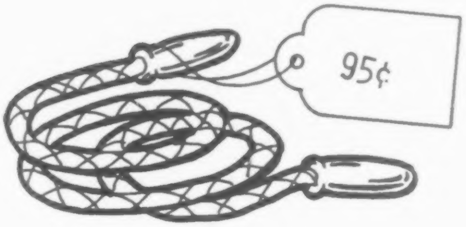
STAR PROBLEMS
GRADE 2, XI

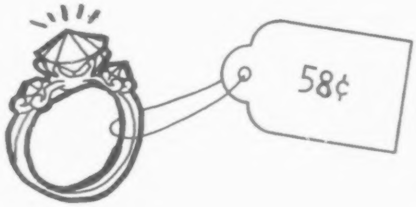
I DID THIS WORK MYSELF! ________________

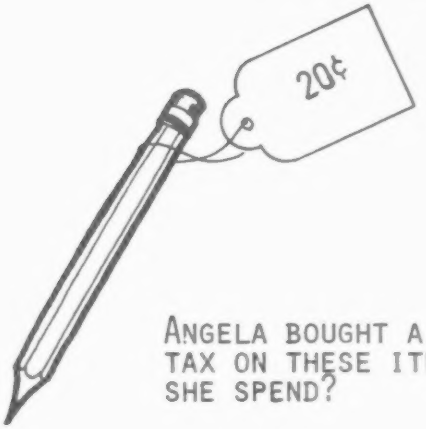
★★ 1. THERE WERE 27 CHILDREN AND 18 ADULTS AT THE PICNIC. TWELVE OF THE CHILDREN WERE IN THE EGG-TOSS CONTEST. HOW MANY CHILDREN WERE NOT IN THE EGG-TOSS CONTEST?

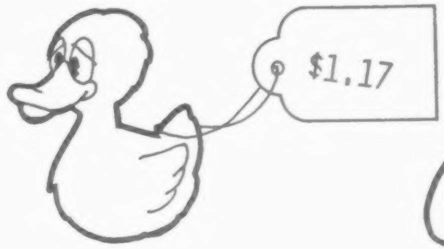
ANSWER: ____CHILDREN

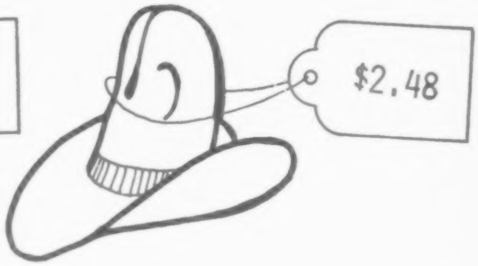
★★ 2.











ANGELA BOUGHT A RING, A PENCIL AND A TOY DUCK. THE TOTAL TAX ON THESE ITEMS IS 8¢. HOW MUCH, INCLUDING TAX, DID SHE SPEND?

ANSWER: ____________

★ 3. CIRCLE THE WORD THAT MAKES THIS STATEMENT TRUE.

A LARGE BOTTLE OF SODA IS MEASURED IN ____________________.

CELSIUS METERS LITERS GRAMS

★★ 4. IF YOU TOOK 4 APPLES FROM A BASKET WITH 44 APPLES IN IT, HOW MANY APPLES WOULD YOU HAVE?

ANSWER: _____ APPLES

★5. CIRCLE THE CORRECT SIGN TO MAKE THIS NUMBER SENTENCE TRUE.

$16 + 12 \boxed{?} 23 + 4$

ANSWER: > = <

★★ 6. THE MOVIE BEGINS AT 2:00 P.M. IT RUNS FOR 2½ HOURS. WHAT TIME WILL THE MOVIE BE OVER?

ANSWER: _____ P. M.

★★★★ 7.

SCORE ON TURN 1

NAME	POINTS
LISA	2
JOHN	7
FRAN	10
MICKY	5
SUKI	7

A) WHO HAD THE HIGHEST SCORE ON THE FIRST TURN? __________

B) JOHN SCORED HOW MANY MORE POINTS THAN LISA? ____

C) SUKI HAD A TOTAL OF 12 POINTS AFTER HER SECOND TURN. HOW MANY POINTS DID SHE SCORE ON HER SECOND TURN?

ANSWER: _____

★★ 8. FIND THE ANSWER TO THIS PROBLEM BY USING A CALCULATOR.

11004 - 3269

TURN THE CALCULATOR UPSIDE DOWN.

WHAT WORD DOES IT SPELL? ____________________

STAR PROBLEMS
GRADE 2, XII

I DID THIS WORK MYSELF: ____________

★★★★ 1. FILL-IN THE CHART TO THE RIGHT TO SHOW THE DIFFERENT WAYS TO HAVE 15¢. ONE WAY--WITH 15 PENNIES--HAS BEEN DONE FOR YOU ALREADY.

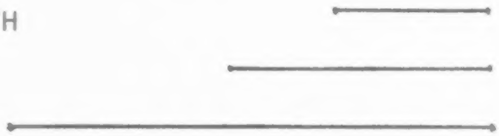
PENNIES	NICKELS	DIMES
15	0	0

SCHOOL STORE	
PENCIL	$ .10
NOTEBOOK	$1.50
ERASER	$ .15
PEN	$ .30
TABLET	$ .75

★★ 2. JANE HAS $2 THAT SHE CAN SPEND AT THE SCHOOL STORE. WHICH OF THESE ITEMS CAN SHE BUY? CIRCLE YOUR ANSWER.

A. 1 NOTEBOOK AND TABLET
B. 1 NOTEBOOK AND PEN
C. 3 TABLETS
D. 10 PENCILS AND 1 NOTEBOOK

★ 3. MEASURE THE LINES SHOWN, AND WRITE DOWN THE LENGTH TO THE CLOSEST WHOLE NUMBER OF CENTIMETERS.



___CM
___CM
___CM

★★ 4. FIND THE MISSING NUMBERS, BY ADDING ACROSS AND DOWN.

Add →			Sum ?
↓	8	9	
Sum →	14	16	

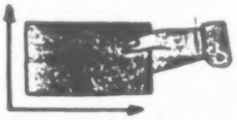
★ 5. WRITE THE STANDARD NUMERAL FOR THESE EXPANDED NUMERALS:

A. 80 + 4 + 300 = ________

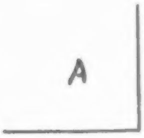
B. 4 + 600 + 20 = ________

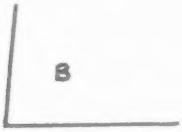
C. 100 + 5 + 90 = ________

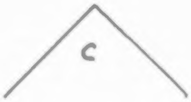
★ 6. A RIGHT ANGLE LOOKS LIKE THIS:

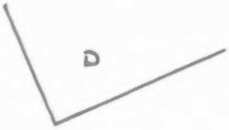


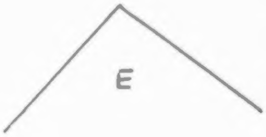
AN EASY WAY TO FIND A RIGHT ANGLE IS TO SEE IF THE CORNER OF A PIECE OF PAPER JUST FITS INTO IT. TEST THE ANGLES BELOW THIS WAY, AND CIRCLE ANY THAT ARE RIGHT ANGLES.





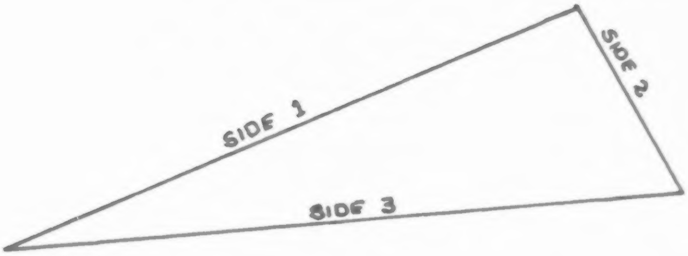






★★ 7. THE PERIMETER OF A SHAPE IS THE DISTANCE ALL THE WAY AROUND IT. USE A RULER, AND MEASURE THE PERIMETER OF THIS TRIANGLE, IN CENTIMETERS.

ANSWER: THE PERIMETER IS ___CM.

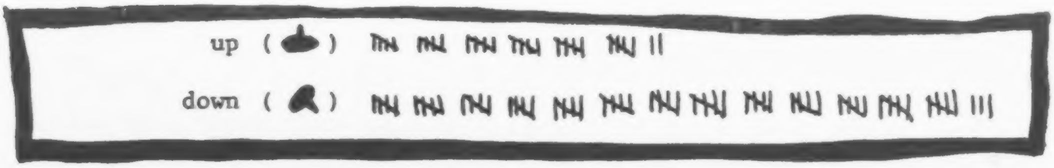


★★★★ 8. MARIA DROPPED A THUMB TACK 100 TIMES. HER RESULTS ARE SHOWN IN THE CHART. WHAT IS THE BEST JUDGEMENT SHE CAN MAKE ABOUT DROPPING A THUMB TACK? (BUBBLE-IN YOUR CHOICE.)

○ IT IS MORE LIKELY TO LAND UP THAN DOWN.

○ IT IS MORE LIKELY TO LAND DOWN THAN UP.

○ IT IS JUST AS LIKELY TO LAND DOWN AS UP.



STAR PROBLEMS
GRADE 2, XIII

I HAVE DONE THIS WORK MYSELF: __________

★★ 1. EVERY LETTER OF THE ALPHABET HAS A MONEY VALUE:

A=$1
B=$2
C=$1
D=$2
E=$1
F=$2
G=$1
H=$2
I=$1
J=$2
K=$1
L=$2
M=$1
N=$2
O=$1
P=$2
Q=$1
R=$2
S=$1
T=$2
U=$1
V=$2
W=$1
X=$2
Y=$1
Z=$2

WHAT IS THE MONEY VALUE OF YOUR FIRST NAME? $_____

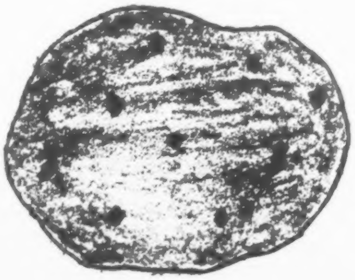
★ 2. "BOBBY" HAS THE VALUE OF $8. IS YOUR FIRST NAME WORTH LESS THAN "BOBBY," MORE THAN "BOBBY," OR THE SAME AS "BOBBY?"

ANSWER: MY NAME IS WORTH ______________________________.

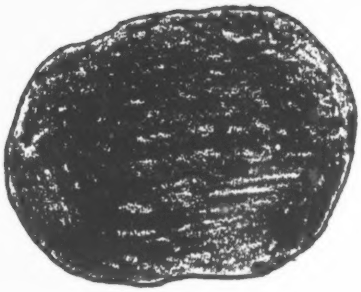
★★★ 3. THE LETTERS OF THE ALPHABET WITH A $1 VALUE ARE CALLED "ODD." THE LETTERS WITH A $2 VALUE ARE CALLED "EVEN." USE THE CHART ABOVE TO ANSWER THESE QUESTIONS.

THE 1ST LETTER OF THE ALPHABET IS ________. (ODD OR EVEN)
THE 2ND LETTER OF THE ALPHABET IS ________. (ODD OR EVEN)
THE 3RD LETTER OF THE ALPHABET IS ________. (ODD OR EVEN)
THE 4TH LETTER OF THE ALPHABET IS ________. (ODD OR EVEN)
THE 5TH LETTER OF THE ALPHABET IS ________. (ODD OR EVEN)
THE 6TH LETTER OF THE ALPHABET IS ________. (ODD OR EVEN)
THE 7TH LETTER OF THE ALPHABET IS ________. (ODD OR EVEN)

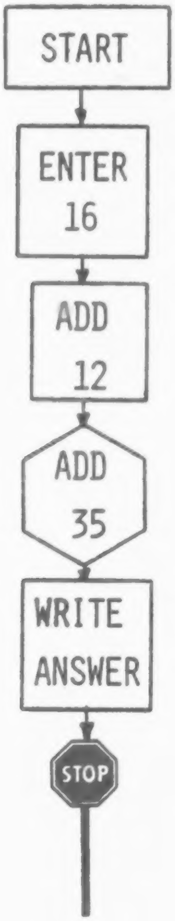
★ 4. DRAW A LINE IN THE COOKIE TO THE RIGHT, TO SHOW A FAIR WAY TO SHARE IT WITH ONE OF YOUR FRIENDS.



★★ 5. DRAW LINES IN THE COOKIE TO THE
RIGHT, TO SHOW A FAIR WAY TO
SHARE IT WITH TWO OF YOUR FRIENDS.



★ 6. USE A CALCULATOR TO FIND THE ANSWER TO THE FLOWCHART PROBLEM. THEN WRITE YOUR ANSWER.


START
ENTER 16
ADD 12
ADD 35
WRITE ANSWER
STOP

ANSWER: _____

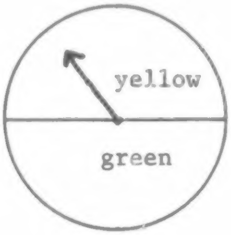
★★★ 7. IF CHRISTMAS DAY (DECEMBER 25TH) CAME ON FRIDAY ONE YEAR, HOW MANY SUNDAYS HAD ALREADY PASSED THAT MONTH?

ANSWER: ___ SUNDAYS

STAR PROBLEMS
GRADE 2, XIV

I DID THIS WORK MYSELF: __________

★★ 1. IF YOU SPIN THE SPINNER FOR THIS GAME, WHAT IS THE CHANCE YOU WILL LAND ON YELLOW? WRITE THE ANSWER USING A FRACTION.

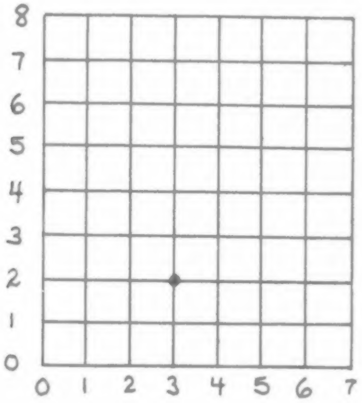

yellow
green

ANSWER: ☐

★★ 2. THE POINT (3,2) HAS BEEN MARKED FOR YOU. TO FIND (3,2), YOU START AT THE BOTTOM LEFT CORNER, GO OVER 3, AND UP 2, AND MAKE A DOT THERE.

MAKE DOTS ON THESE POINTS:

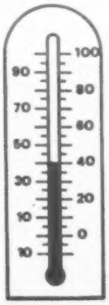
(3,2)
(3,7)
(5,7)
(5,5)
(3,5)


8
7
6
5
4
3
2
1
0
0 1 2 3 4 5 6 7

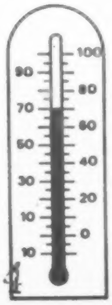
★ 3. CONNECT THE DOTS FOR THE PROBLEM ABOVE, IN ORDER, AND YOU'LL MAKE A LETTER OF THE ALPHABET. WHAT LETTER?

ANSWER: ____

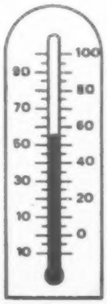
★ 4. WRITE THE TEMPERATURE SHOWN ON EACH THERMOMETER. PUT YOUR ANSWER ON THE LINE BESIDE THE THERMOMETER.


90
70
50
30
10
10
100
80
60
40
20
0

___°C

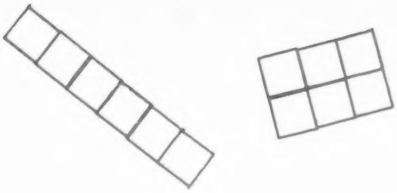

90
70
50
30
10
10
100
80
60
40
20
0

___°C


90
70
50
30
10
10
100
80
60
40
20
0

___°C

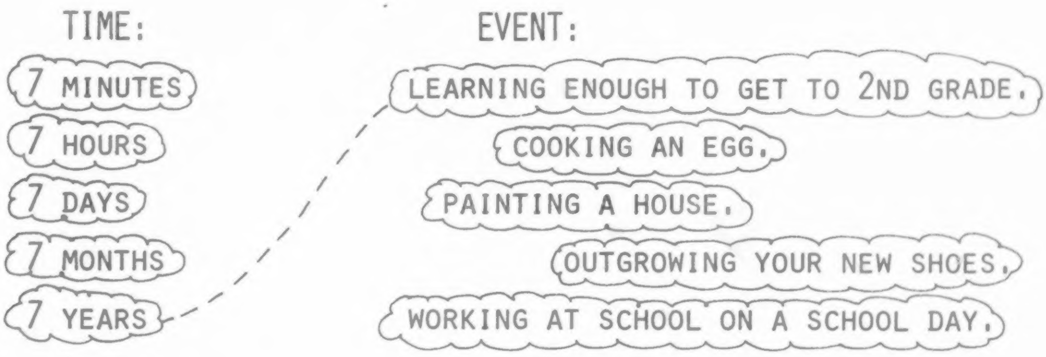
★★★ 5. IF SOMEONE GIVES YOU 6 SMALL SQUARES, THERE WOULD BE ONLY TWO WAYS TO MAKE A RECTANGLE. THESE TWO WAYS ARE SHOWN TO THE RIGHT.



HOW MANY RECTANGLES COULD YOU MAKE IF THEY GAVE YOU 10 SMALL SQUARES? HOW MANY WITH 5 SMALL SQUARES? HOW MANY WITH 12 SMALL SQUARES? DRAW THE CORRECT RECTANGLES FOR EACH BOX BELOW.

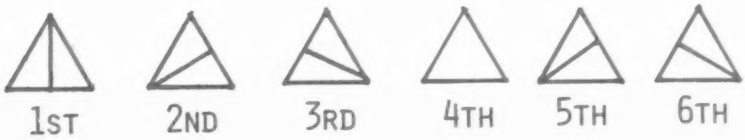
FOR 10 SQUARES:	FOR 5 SQUARES:	FOR 12 SQUARES:

★★ 6. DRAW A LINE TO SHOW ABOUT HOW MUCH TIME GOES WITH EACH EVENT. ONE OF THEM IS STARTED FOR YOU ALREADY.



TIME:	EVENT:
7 MINUTES	LEARNING ENOUGH TO GET TO 2ND GRADE.
7 HOURS	COOKING AN EGG.
7 DAYS	PAINTING A HOUSE.
7 MONTHS	OUTGROWING YOUR NEW SHOES.
7 YEARS	WORKING AT SCHOOL ON A SCHOOL DAY.

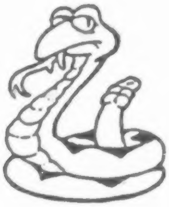
★★ 7. DRAW THE LINE THAT IS MISSING IN THE FOURTH TRIANGLE.



STAR PROBLEMS
GRADE 2, XV

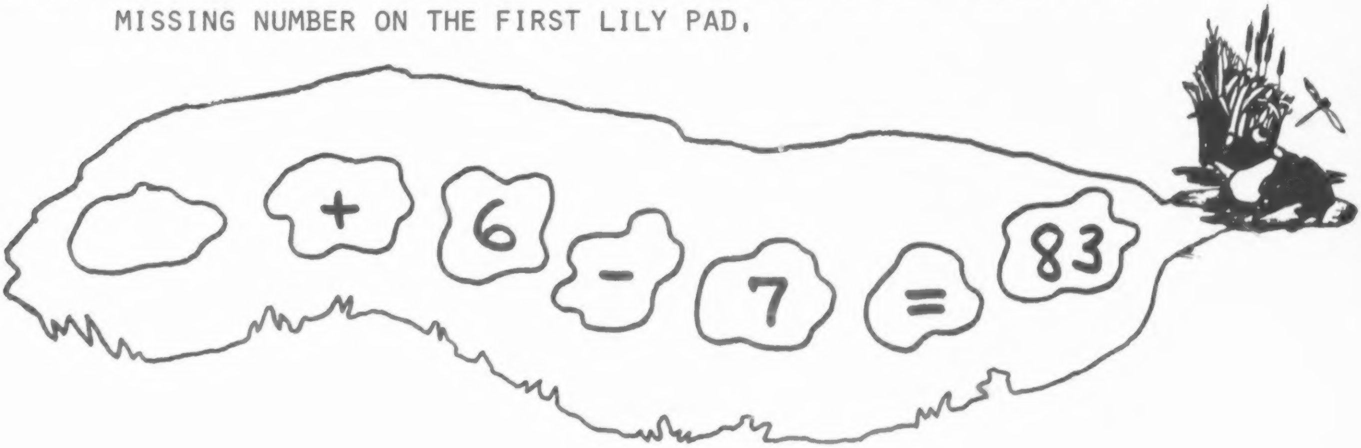
I DID THIS WORK MYSELF: ____________

★★ 1. BILL FOUND 7 SNAKES AND 6 FROGS ON SATURDAY. THAT NIGHT 3 OF THE SNAKES, AND 2 OF THE FROGS, GOT OUT OF THE CAGE AND GOT AWAY INTO THE WOODS. HOW MANY ANIMALS DID BILL HAVE LEFT?



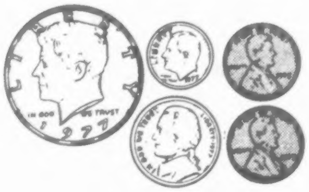
ANSWER: ____ ANIMALS

★★★★ 2. HELP FREIDA THE FROG HOP BACK ACROSS THE POND. FILL IN THE MISSING NUMBER ON THE FIRST LILY PAD.

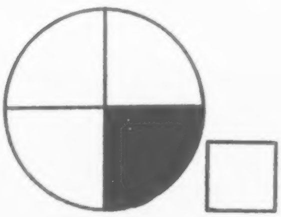


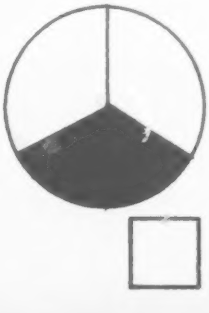
★ 3. HOW MUCH MONEY?

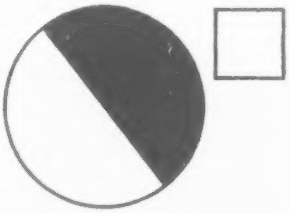
ANSWER: ____



★ 4. WRITE THE FRACTION THAT SHOWS HOW MUCH OF EACH CIRCLE BELOW IS SHADED IN. PUT THE FRACTION IN THE BOX BESIDE THE CIRCLE.



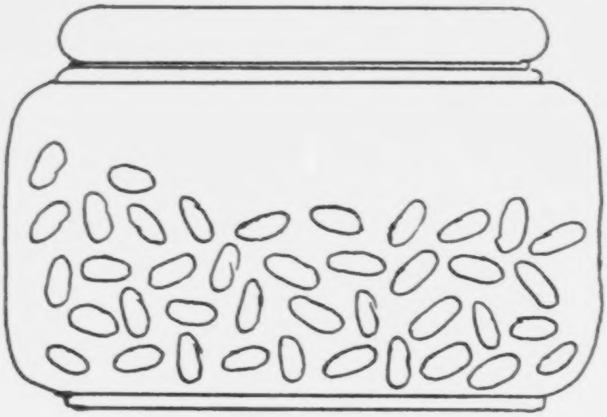




★★ 5. USE THE PICTURES IN PROBLEM 4 TO DECIDE WHICH OF THESE FRACTIONS IS THE LARGEST AMOUNT. CIRCLE THE CORRECT ANSWER.

$\frac{1}{4}$ IS THE LARGEST FRACTION.
$\frac{1}{3}$ IS THE LARGEST FRACTION.
$\frac{1}{2}$ IS THE LARGEST FRACTION.

★ 6. COUNT THE JELLYBEANS IN THE JAR. IS THE TOTAL NUMBER OF JELLYBEANS AN ODD NUMBER, OR AN EVEN NUMBER?

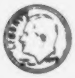


ANSWER: _____ (ODD OR EVEN)

★ 7. HOW MANY MINUTES IN 2 HOURS? ANSWER: ___ MINUTES

★★★ 8. THE JONES KIDS GOT A DIME EACH DAY THEY MADE UP THEIR BEDS. ONE WEEK MARSHA EARNED 40¢, DANNY EARNED 50¢, MOLLY EARNED 40¢, AND BRUCE EARNED 20¢. MAKE A PICTOGRAPH TO SHOW HOW MUCH MONEY EACH KID EARNED. USE A CIRCLE TO SHOW "ONE DIME."

MARSHA	
DANNY	
MOLLY	
BRUCE	

KEY:  = ○

STAR PROBLEMS
GRADE 2, XVI

I DID THIS WORK MYSELF: __________

★★★ 1. BETH HAS 45¢ IN DIMES AND NICKELS. SHE HAS THE SAME NUMBER OF DIMES AS SHE HAS NICKELS. HOW MANY OF EACH DOES SHE HAVE?

ANSWER: SHE HAS __ DIMES AND __ NICKELS.

★★ 2. TAMIKA HAS 1½ COOKIES. SARAH HAS 2½ COOKIES. BILLY HAS 3 COOKIES. IF THEY PUT THEIR COOKIES TOGETHER, HOW MANY COOKIES WOULD THERE BE THEN?

ANSWER: THERE WOULD BE ___ COOKIES.

★★ 3. EIGHT CHILDREN COMPARED THE NUMBER OF BROTHERS AND SISTERS EACH HAS AT HOME.

RICKY HAS 3
SHAWN HAS 1
CINDY HAS 3
BRIAN HAS 2
TERRY HAS 2
JUAN HAS 3
KEN HAS 5
ANGIE HAS 0

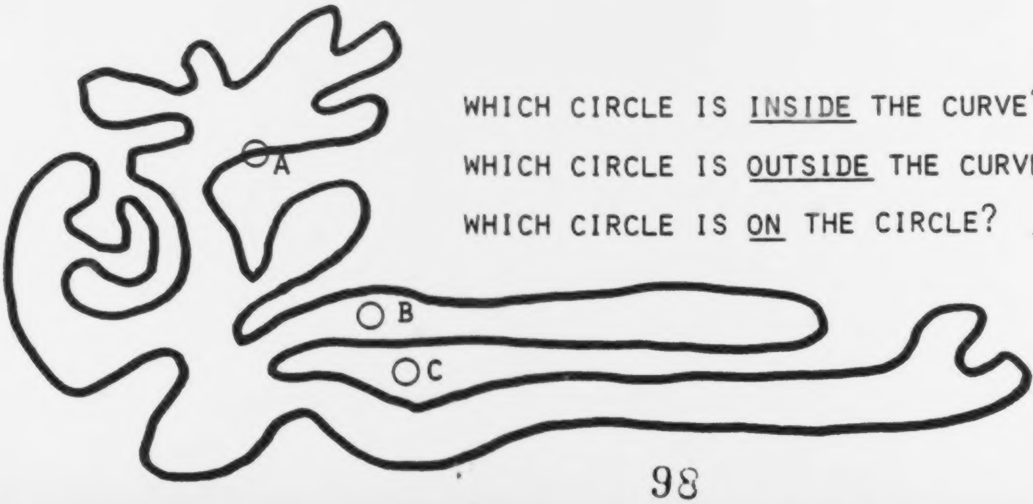
(A) WHICH NUMBER OF BROTHERS AND SISTERS OCCURRED MOST OFTEN?

ANSWER: ____

(B) ALTOGETHER, HOW MANY CHILDREN ARE IN ANGIE'S FAMILY?

ANSWER: ____

★ 4.



WHICH CIRCLE IS INSIDE THE CURVE? ____
WHICH CIRCLE IS OUTSIDE THE CURVE? ____
WHICH CIRCLE IS ON THE CIRCLE? ____

★★★ 5. PUT THE CORRECT NUMBERS IN THE BOXES BELOW TO MAKE TRUE STATEMENTS.

20 + ☐ = 35 46 - ☐ = 21 ☐ - 20 = 50

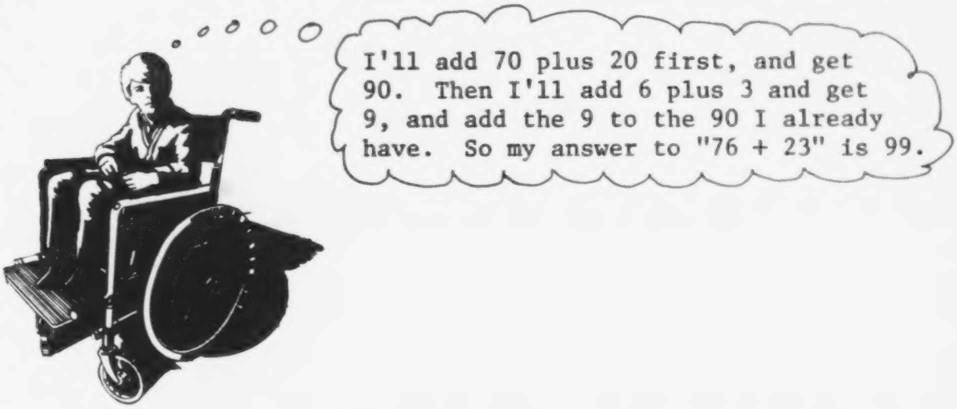
★★★ 6. READ THE FOLLOWING LIST OF NUMBERS. CHOOSE ONLY THE EVEN NUMBERS AND ADD THEM TOGETHER. WHAT IS THE SUM?

FOURTEEN
THIRTY-SEVEN
TWENTY-NINE
EIGHTY-EIGHT

ELEVEN
ONE HUNDRED
FORTY-THREE
SIXTEEN

ANSWER: THE SUM IS ____.

★★★★ 7. SAM BECAME A WHIZ AT DOING ADDITION PROBLEMS IN HIS HEAD, WITHOUT USING PAPER-AND-PENCIL. HE WOULD ADD THE LARGER PART OF THE NUMBERS FIRST, AND THEN ADD-ON THE SMALLER NUMBERS TOO. STUDY HOW HE WOULD DO A PROBLEM LIKE "76 + 23" BY READING THE THOUGHT CLOUD SEVERAL TIMES.


I'll add 70 plus 20 first, and get 90. Then I'll add 6 plus 3 and get 9, and add the 9 to the 90 I already have. So my answer to "76 + 23" is 99.

PRACTICE SAM'S METHOD ON THESE PROBLEMS AND ON SOME MORE THAT YOU MAKE UP YOURSELF. CHECK TO SEE IF YOU ARE RIGHT ON A CALCULATOR. WHEN YOU TURN IN YOUR PAPER, YOU WILL HAVE A PROBLEM LIKE THIS TO DO IN YOUR HEAD.

(A) 45 + 32
(B) 37 + 61
(C) 50 + 43

(D) 82 + 13
(E) 26 + 42
(F) 63 + 27

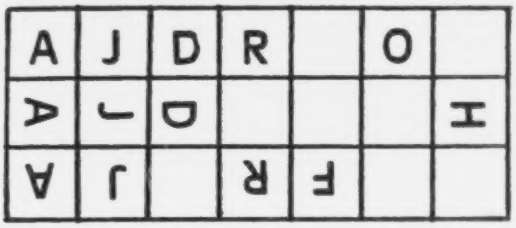
(G) 31 + 24 + 13
(H) 34 + 26
(I) 72 + 18

ANSWER LATER ON:

STAR PROBLEMS
GRADE 2, XVII

I DID THIS WORK MYSELF: __________

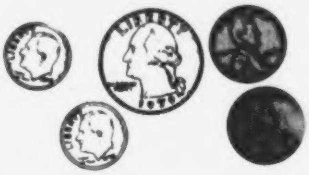
★★ 1. FOLLOWING THE PATTERN, WRITE THE MISSING LETTERS IN THE EMPTY BOXES BELOW. BE SURE TO WRITE THEM IN THE POSITION THAT FOLLOWS THE PATTERN.



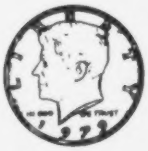
★★★ 2. SALLY HAD A BIRTHDAY PARTY AND INVITED 6 OTHER GIRLS. SHE HAD A BALLOON AND A HAT FOR EACH GIRL. FIVE BALLOONS WERE IN A PACKAGE, AND TWO HATS WERE IN A PACKAGE, WHEN SHE BOUGHT THEM. HOW MANY PACKAGES OF BALLOONS, AND HOW MANY PACKAGES OF HATS, DID SHE HAVE TO BUY?

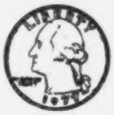
ANSWER: __ PACKAGES OF BALLOONS AND
__ PACKAGES OF HATS

★ 3. THESE COINS



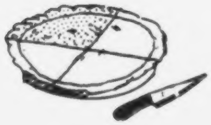
ARE ABOUT AS MUCH AS WHICH OF THESE COINS? DRAW AN X ON THE CORRECT COIN.

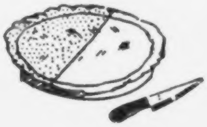


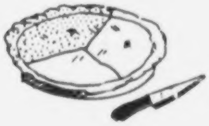


★★ 4. USE THE PICTURES OF THE PIES TO HELP YOU. WHICH IS THE MOST PIE: $\frac{1}{2}$ OF THE PIE, $\frac{1}{3}$ OF THE PIE, OR $\frac{1}{4}$ OF THE PIE?

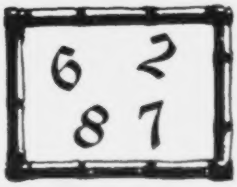
ANSWER: ☐ OF THE PIE







★★★★ 5. HOW MANY DIFFERENT, 2-DIGIT NUMERALS CAN YOU MAKE FROM THE DIGITS TO THE RIGHT? DO NOT COUNT 22, 66, 77, AND 88.

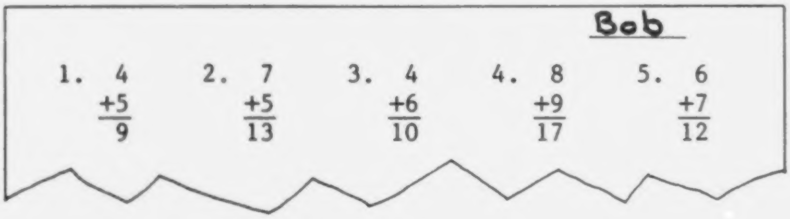


ANSWER: THERE ARE ___ 2-DIGIT NUMERALS THAT CAN BE MADE FROM THOSE ABOVE.

★ 6. MARY LEFT HER HOUSE AT 1:00 P.M. TO WALK TO THE MOVIE. IT TOOK HER ½ HOUR TO GET THERE. WHAT TIME DID SHE GET TO THE MOVIE?

ANSWER: AT ____ P.M.

★★★ 7. CHECK BOB'S MATH PAPER. USE ✓'S AND X'S.

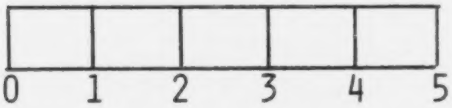


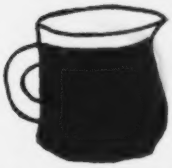
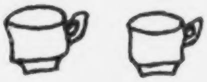
Bob

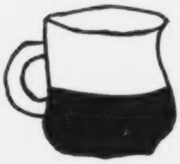
1.	2.	3.	4.	5.
4	7	4	8	6
+5	+5	+6	+9	+7
9	13	10	17	12

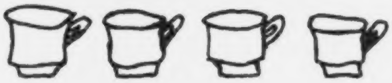
NOW COLOR ☐'S TO SHOW HOW MANY BOB GOT RIGHT:

NUMBER RIGHT



★★ 8. 1 PINT  FILLS 

SHADE IN THE CUPS YOU CAN FILL WITH ½ PINT 

ANSWER: 

STAR PROBLEMS
GRADE 2, XVIII

I DID THIS WORK MYSELF: ________

★★ 1. JUHAN MADE A TIC-TAC-TOE. WHEN HE ADDED THE NUMBERS UNDER HIS X'S, HE GOT A SUM OF 100. PUT JUHAN'S X'S ON THE GAME.

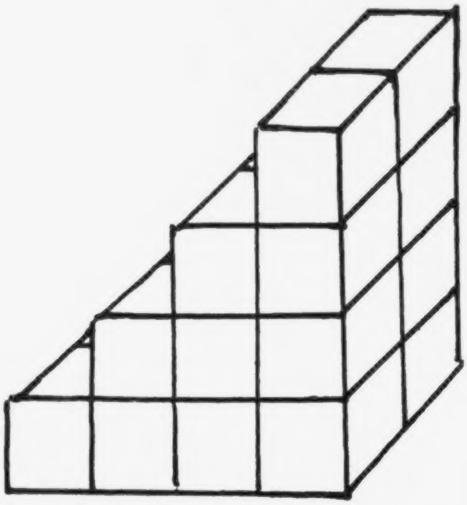
47	42	78
18	26	56
45	34	91

★ 2. I HAD 15 PIGS IN ONE PEN AND 10 PIGS IN ANOTHER. I SOLD 4 PIGS FROM ONE PEN AND 6 FROM THE OTHER. HOW MANY PIGS ARE LEFT?

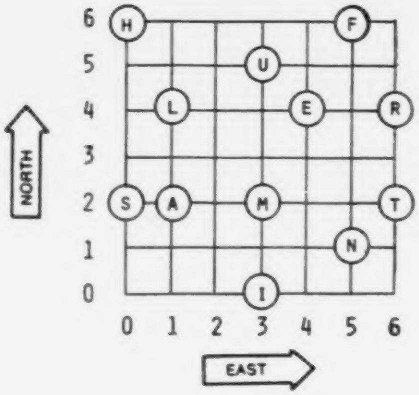
ANSWER:_____ PIGS

★★ 3. HOW MANY SMALL CUBES DOES IT TAKE TO MAKE THIS SOLID?

ANSWER:_____ CUBES



★★ 4. FIND EACH LETTER BY GOING EAST AND THEN NORTH THE RIGHT NUMBER OF STEPS. THE FIRST 2 LETTERS HAVE BEEN DONE FOR YOU, AS A HINT.



FIRST WORD:

GO EAST:	3	1	6	0
GO NORTH:	2	2	2	6
LETTER:	M	A	☐	☐

SECOND WORD:

GO EAST:	3	0
GO NORTH:	0	2
LETTER:	☐	☐

THIRD WORD

GO EAST:	5	3	5
GO NORTH:	6	5	1
LETTER:	☐	☐	☐

★★★ 5. USE A CALCULATOR TO FIND THREE CONSECUTIVE NUMBERS THAT ADD UP TO 45. (HINT: CONSECUTIVE NUMBERS ARE LIKE 5, 6, AND 7.)

ANSWER: THE THREE NUMBERS ARE ___, ___ AND ___.

★★★ 6. EACH OF THE 25 STUDENTS IN MS. BROWN'S CLASS HAS A DIFFERENT FIRST NAME. HOW MANY STUDENTS WERE ABSENT AT LEAST 1 DAY DURING THIS WEEK?

DAYS OF THE WEEK	STUDENTS ABSENT
MONDAY	SUE, BILL
TUESDAY	BILL
WEDNESDAY	ANN, JOE, MARY
THURSDAY	
FRIDAY	BILL, TONY, MARY, LISA

ANSWER: ☐

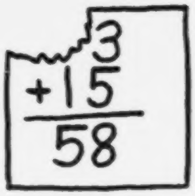
★ 7. HOW MUCH MONEY WOULD YOU EXPECT TO PAY FOR A PACK OF GUM AT A STORE NEAR YOUR HOUSE? CIRCLE THE BEST ANSWER.

A. 35¢ B. $1.75 C. 5¢ D. $1.00

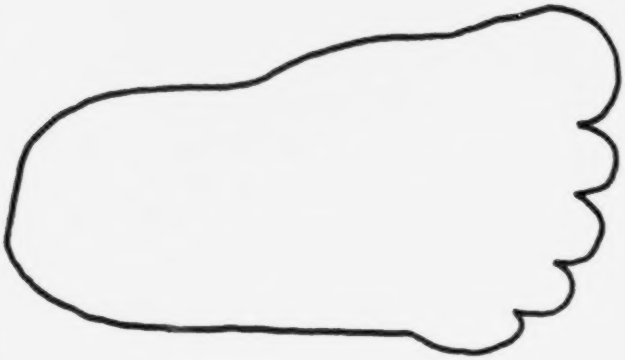
STAR PROBLEMS
GRADE 2, XIX

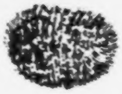
I DID THIS WORK MYSELF: __________

★ 1. FIND THE NUMBER THAT WAS TORN FROM THIS PAPER. WRITE IT IN THE CORRECT PLACE.



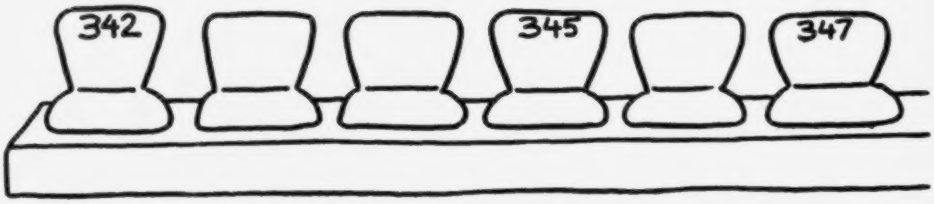
★★ 2. SAM COVERED THE BABY'S FOOTPRINT WITH HIS THUMB. HOW MANY OF SAM'S THUMB PRINTS WOULD IT TAKE TO COVER THIS FOOT SHAPE?



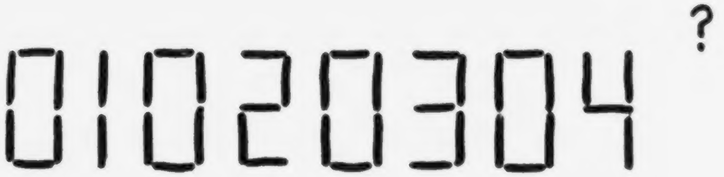
SAM'S THUMB PRINT: 

ANSWER: IT WOULD TAKE ABOUT ____ THUMB PRINTS.

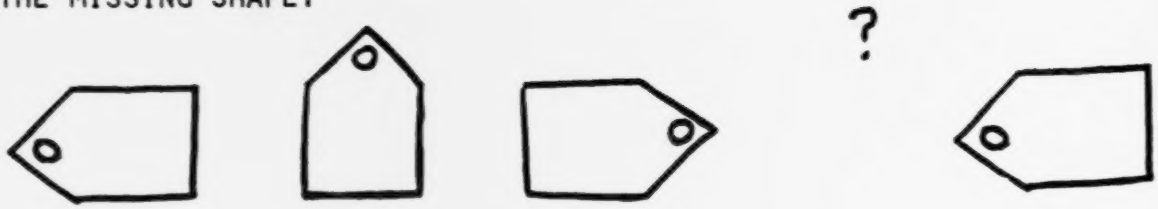
★ 3. ED'S TICKET FOR THE CIRCUS SAID "SEAT 344." COLOR IN THE PLACE WHERE ED WILL SIT.



★ 4. PUT IN THE MISSING NUMBER.

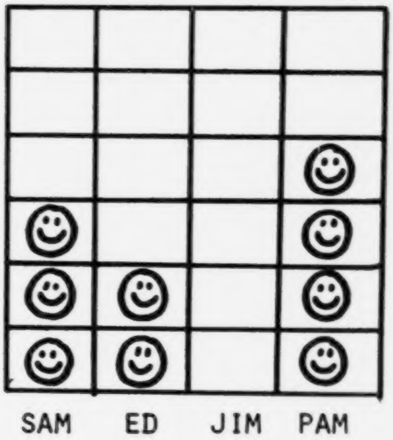


★ 5. DRAW THE MISSING SHAPE.



6. HERE IS A PICTOGRAPH THAT'S NOT FINISHED.

1 ☺ FOR 5 GOOD PAPERS

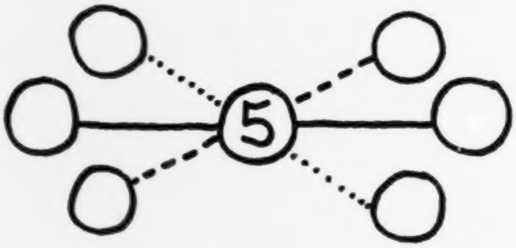


★ A. JIM HAS 5 ☺ STICKERS TO RECORD ON THE GRAPH. DRAW JIM'S ☺ STICKERS ON THE GRAPH FOR HIM.

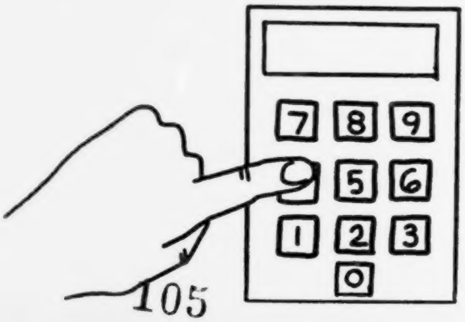
★★ B. HOW MANY GOOD PAPERS DID ED HAVE?

ANSWER: ___ GOOD PAPERS

★★ 7. PUT THE NUMBERS 4, 0, 3, 1, 2, AND 5 IN THE CIRCLES BELOW SO EACH LINE HAS A SUM OF 10.



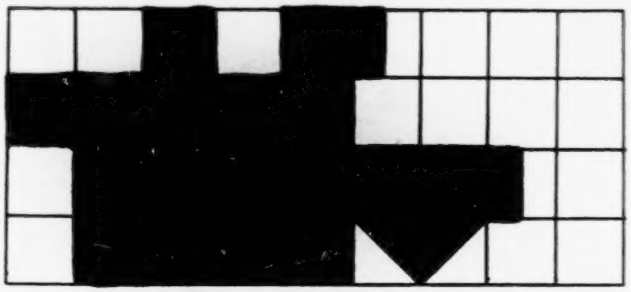
★ 8. WRITE THE NUMBER YOU WILL SEE ON THE CALCULATOR DISPLAY.



STAR PROBLEMS
GRADE 2, XX

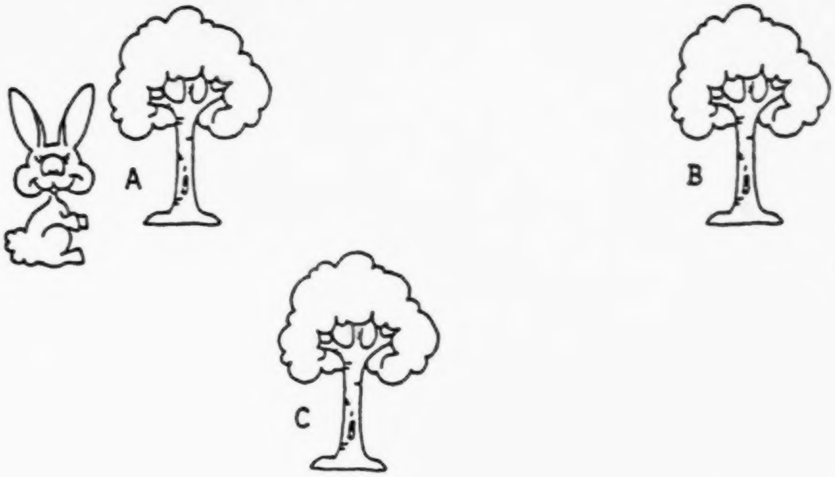
I DID THIS WORK MYSELF: ____________

★★★ 1. HOW MANY SQUARE CENTIMETERS DOES IT TAKE TO MAKE THE DARK FIGURE?



ANSWER: ___ □'s

★★ 2. A RABBIT TOOK 6 HOPS TO GET FROM TREE A TO TREE B, 5 HOPS TO GET FROM TREE B TO TREE C, AND 3 HOPS TO GET FROM TREE C BACK TO TREE A. DRAW A PICTURE OF ALL THE HOPS THE RABBIT MADE, AND THEN USE YOUR DRAWING TO FIND OUT HOW MANY HOPS IN ALL THE RABBIT MADE.



ANSWER: ___ HOPS

★★★★ 3. USE A CALCULATOR TO DO EACH PROBLEM BELOW.

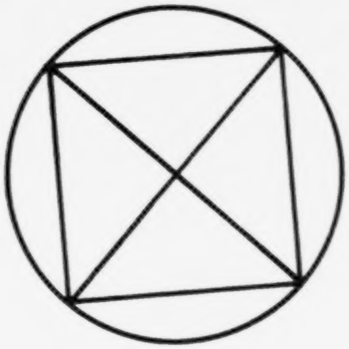
33 + 29 + 64 = ______

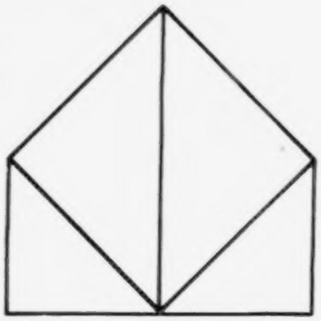
105 + 41 + 89 = ______

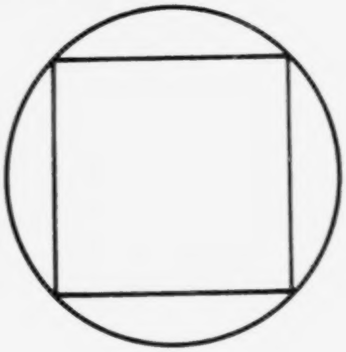
93 - 57 + 16 = ______

213 - 94 - 96 = ______

★★ 4. WHICH ONE OF THESE SHAPES CAN BE DRAWN WITHOUT LIFTING YOUR PENCIL OR GOING OVER THE SAME LINE TWICE? CIRCLE IT.







★★ 5. FILL IN THE BAR GRAPH TO SHOW HOW MANY OF EACH PET WAS OWNED BY THIS SECOND GRADE CLASS.

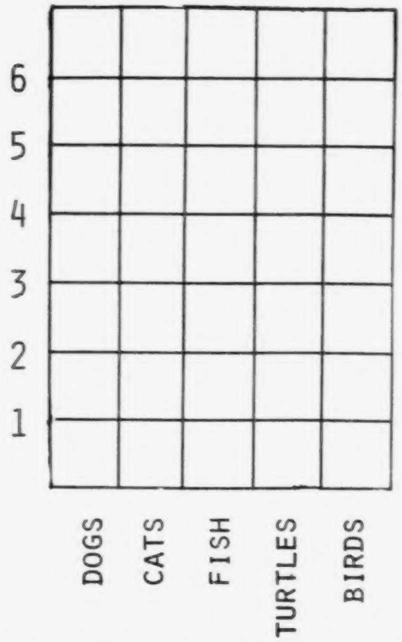
DOGS - 6

CATS - 6

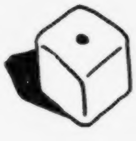
FISH - 3

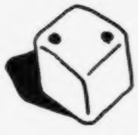
TURTLES - 2

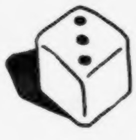
BIRDS - 1

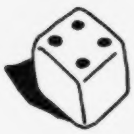


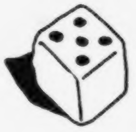
★★★ 6. THROW A DIE 25 TIMES. EACH TIME YOU THROW IT MAKE A TALLY MARK UNDER THE PICTURE OF THE SIDE THAT LANDS "UP".

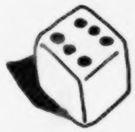












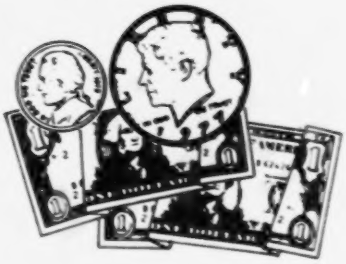
______ ______ ______ ______ ______ ______

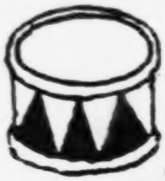
WHICH SIDE LANDED UP MOST OFTEN? CIRCLE IT ABOVE.

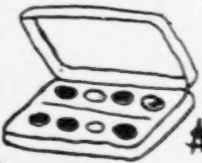
STAR PROBLEMS
GRADE 2, XXI

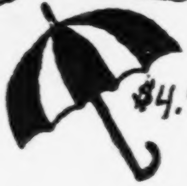
I DID THIS WORK MYSELF: ____________

★ 1. WHAT COULD YOU BUY WITH THE MONEY SHOWN? CIRCLE YOUR ANSWER.

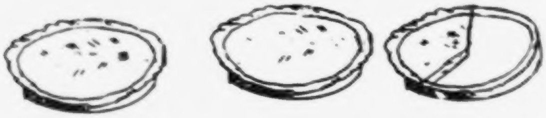






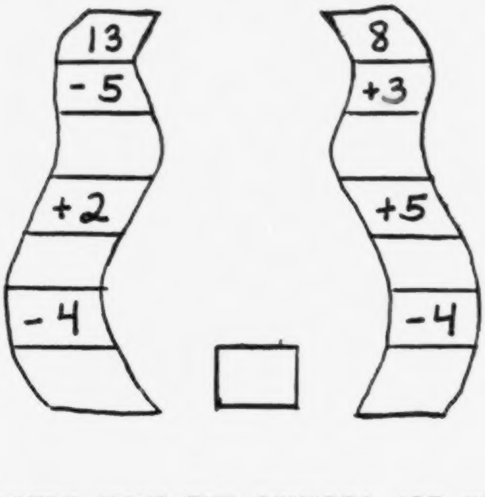


★★ 2. ABOUT HOW MANY PIES ARE SHOWN? CIRCLE THE BEST ANSWER.



A. 2 PIES
B. 2½ PIES
C. 3 PIES

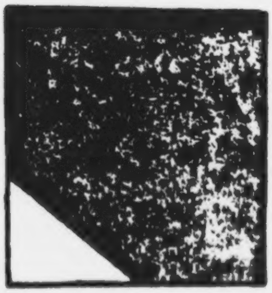
★★ 3. FILL IN EACH BLANK SPACE BY MOVING DOWN THE TAPE. THEN COMPARE YOUR FINAL ANSWERS BY PUTTING >, <, OR = IN THE BOX BETWEEN THEM.

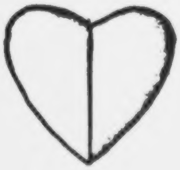


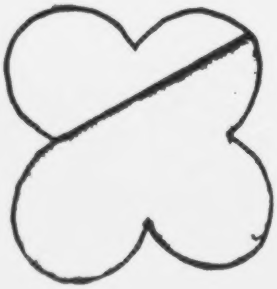
★★★ 4. FILL IN THE NUMBERS THAT THE SQUARES ARE COVERING UP.

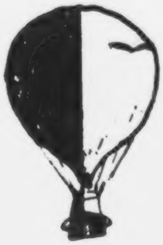
36 + ☐ = 79   46 - ☐ = 15   ☐ + 23 = 68

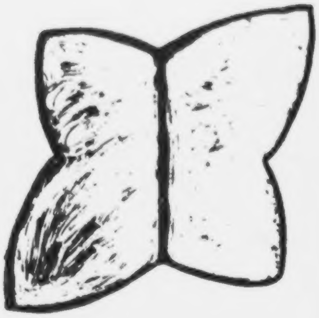
★ 5. COLOR EACH PICTURE THAT IS DIVIDED EXACTLY IN HALF.











★★ 6. SUSIE IS HAVING A BIRTHDAY PARTY IN TWO WEEKS. SHE WILL BE 7 YEARS OLD. HOW MANY DAYS IS IT UNTIL HER PARTY?

ANSWER: ____ DAYS

★★ 7. USE A CALCULATOR TO FIND THE TOTAL COST OF THESE DRESSES.

$12.50

$10.99

$7.84

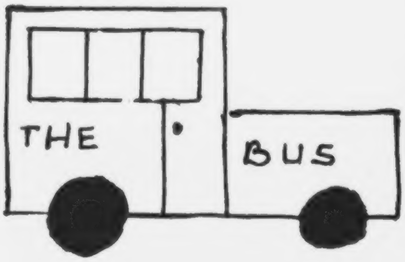
ANSWER: ______________

★★★ 8. I AM THINKING OF TWO NUMBERS THAT ADD TO TWENTY-ONE.
ONE NUMBER IS 3 MORE THAN THE OTHER.
WHAT ARE THE NUMBERS?

ANSWER: ___ AND ___

STAR PROBLEMS
GRADE 2, XXII

I DID THIS WORK MYSELF: ____________

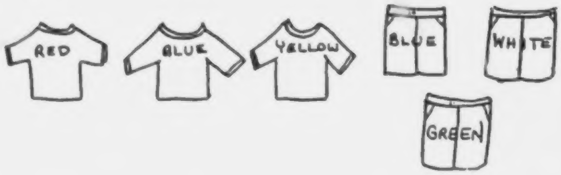


★★ 1. THERE ARE 8 MOTHERS, 7 FATHERS, 3 BOY SCOUTS AND 5 GIRL SCOUTS ON THE BUS.

HOW MANY FEMALES ARE ON THE BUS? ___
HOW MANY MALES ARE ON THE BUS? ___

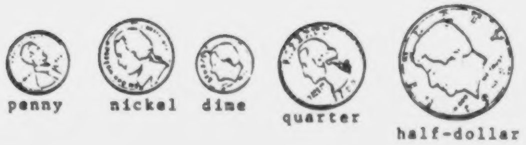
HOW MANY PEOPLE ARE ON THE BUS? ___

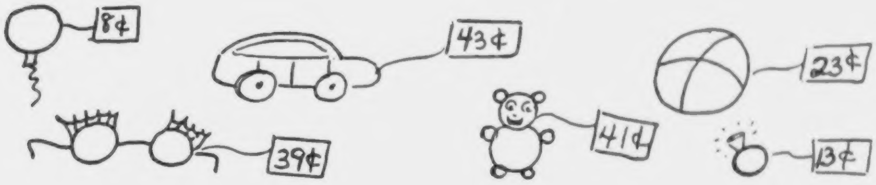
★★★★ 2. DAVID IS GOING TO SUMMER CAMP. HE HAS 3 NEW PAIRS OF SHORTS, AND 3 NEW SHIRTS TO TAKE WITH HIM. LIST ALL THE DIFFERENT OUTFITS THAT HE CAN WEAR AT CAMP. (THE LIST IS STARTED FOR YOU.)


RED
BLUE
YELLOW
BLUE
WHITE
GREEN

(RED, BLUE) (,) (,)
(RED, WHITE) (,) (,)
(RED,) (,) (,)

★★ 3. WHICH COIN IS CLOSEST TO THE COST OF THESE TOYS?

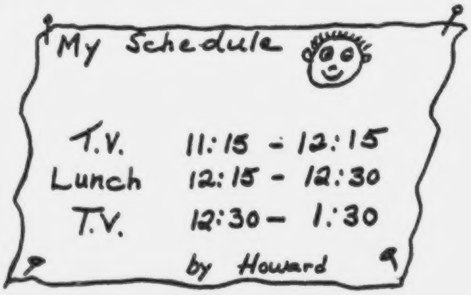

penny
nickel
dime
quarter
half-dollar


8¢
43¢
23¢
39¢
41¢
13¢

ANSWER: THE BALLOON IS CLOSEST TO THE __________.
THE CAR IS CLOSEST TO THE __________.
THE BALL IS CLOSEST TO THE __________.
THE BEAR IS CLOSEST TO THE __________.
THE RING IS CLOSEST TO THE __________.

HINT: A COIN CAN BE USED MORE THAN ONCE!

★ 4. HOWARD WATCHES T.V. FROM 11:15 A.M. TILL 12:15 P.M. HE EATS LUNCH FROM 12:15 P.M. TILL 12:30 P.M., AND THEN WATCHES T.V. AGAIN UNTIL 1:30 P.M. HOW MANY HOURS DOES HOWARD WATCH T.V.?



My Schedule

T.V. 11:15 - 12:15
Lunch 12:15 - 12:30
T.V. 12:30 - 1:30

by Howard

ANSWER: ______ HOURS

★★ 5. DECIDE ON THE CORRECT ORDER FOR THESE STEPS SO YOU COULD TAKE YOUR PET ALLIGATOR FOR A WALK. THEN WRITE THE STEPS IN THE FLOWCHART CORRECTLY.

STEPS

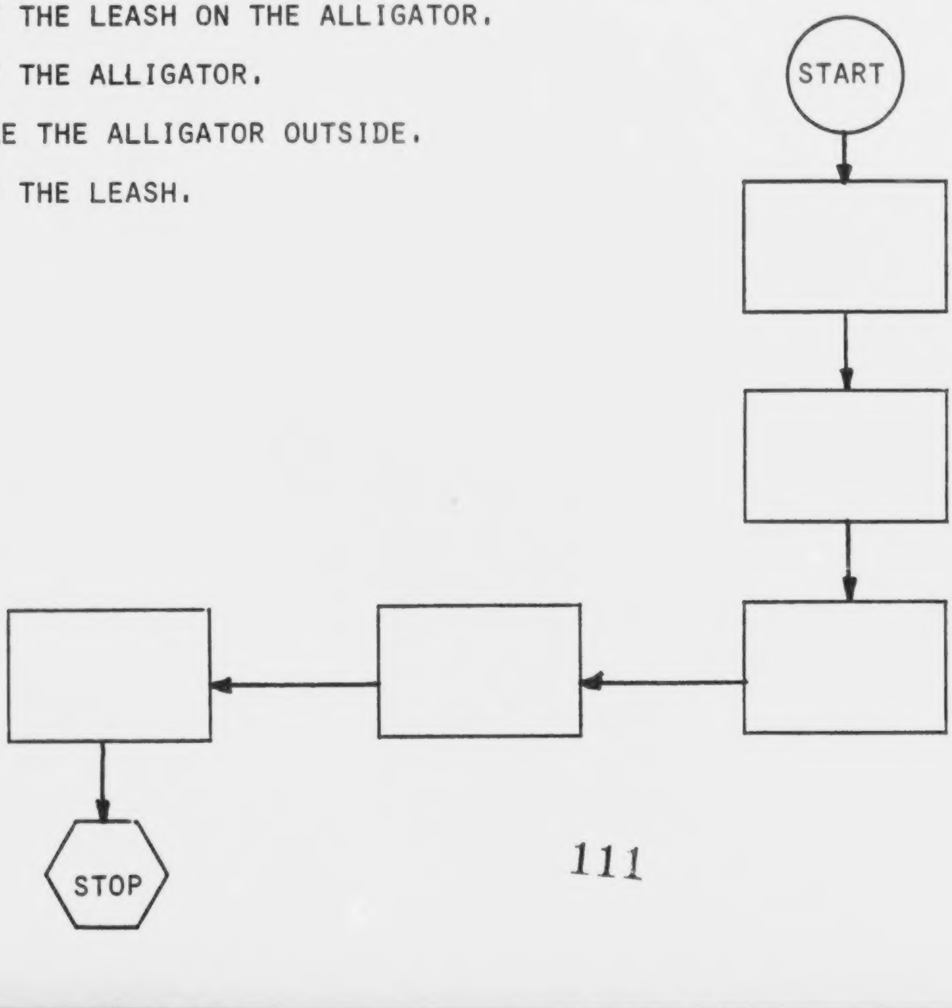
OPEN THE DOOR.

PUT THE LEASH ON THE ALLIGATOR.

GET THE ALLIGATOR.

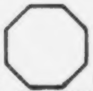
TAKE THE ALLIGATOR OUTSIDE.

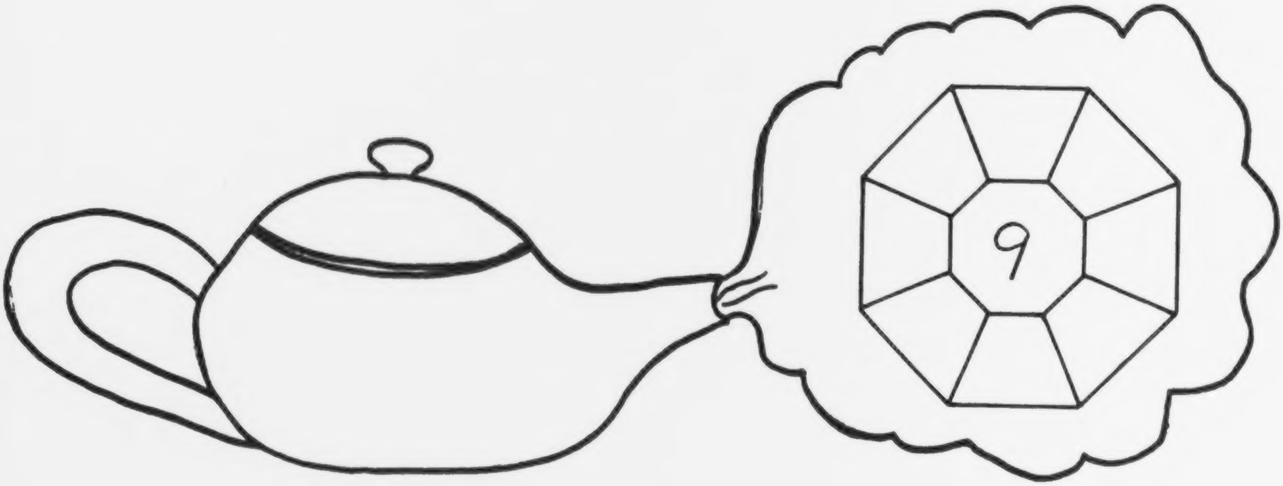
GET THE LEASH.



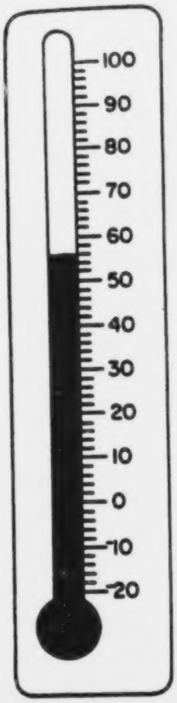
STAR PROBLEMS
GRADE 2 XXIII

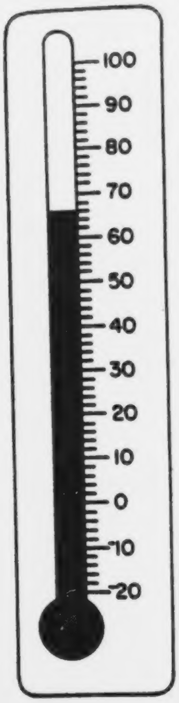
I DID THIS WORK MYSELF:____________________

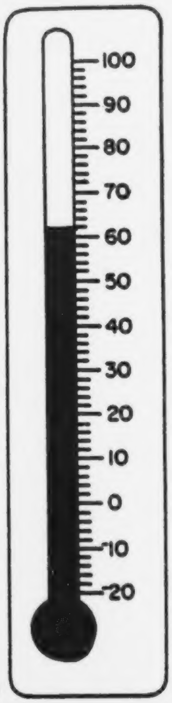
**1. THIS IS A MAGIC . PUT THE NUMBERS 1 THROUGH 8 IN THE BOXES SO THAT THE SUM OF THREE NUMBERS IN EACH ROW IS 18. USE EACH NUMBER ONLY ONCE.

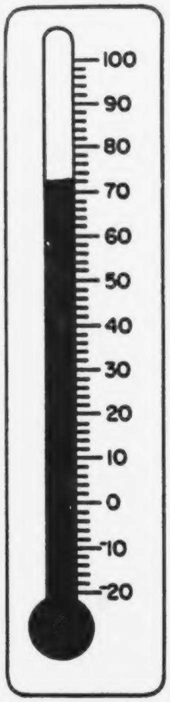


** 2. CIRCLE THE THERMOMETER THAT SHOWS A TEMPERATURE OF 62°.


100
90
80
70
60
50
40
30
20
10
0
-10
-20


100
90
80
70
60
50
40
30
20
10
0
-10
-20


100
90
80
70
60
50
40
30
20
10
0
-10
-20


100
90
80
70
60
50
40
30
20
10
0
-10
-20

★★★ 3. USE THE CODE TO HELP FIND THE STARTING NUMBERS IN EACH ROW. FILL THE ☐ WITH THE NUMBER.

☐ ← ⟸ ← ←o– ⟸ 43

☐ ← ←o– ← ⟸ ← 77

☐ ⟸ ← ⟸ ← ←o– 61

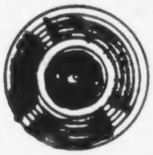
CODE

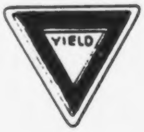
SUBTRACT 2 ←o–

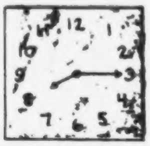
ADD 3 ←

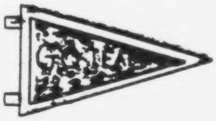
SUBTRACT 4 ⟸

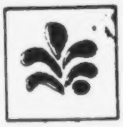
★ 4. FIND THE TRIANGLES BELOW AND CIRCLE THEM.

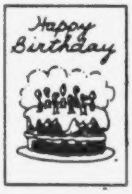


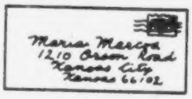


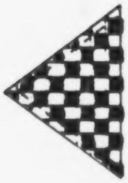

12
1
2
3
4
5
6
7
8
9
10
11

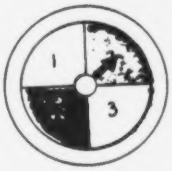


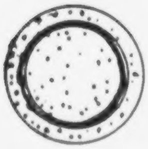


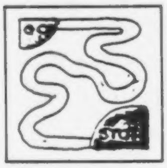

Happy Birthday


Maria Marcya
1210 Green Road
Kansas City
Kansas 66102

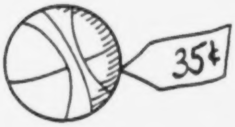


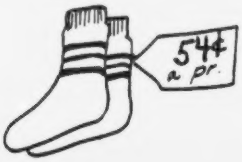


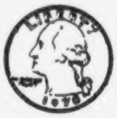
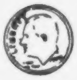
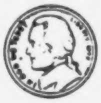
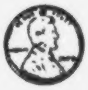




★★★ 5. BUY WHAT IS IN EACH PICTURE WITH 75¢. SHOW HOW MUCH CHANGE YOU WILL GET BACK USING THE FEWEST NUMBER OF COINS.





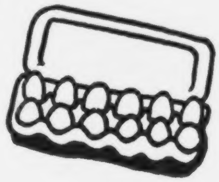
			

STAR PROBLEMS

GRADE 2, XXIV

I HAVE DONE THIS WORK MYSELF: ______________

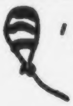
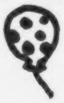
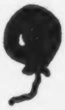
★★1. MRS. BROWN HAD NINE EGGS. SHE BOUGHT A DOZEN MORE AND USED A HALF-DOZEN OF THEM. HOW MANY DOES SHE HAVE LEFT?

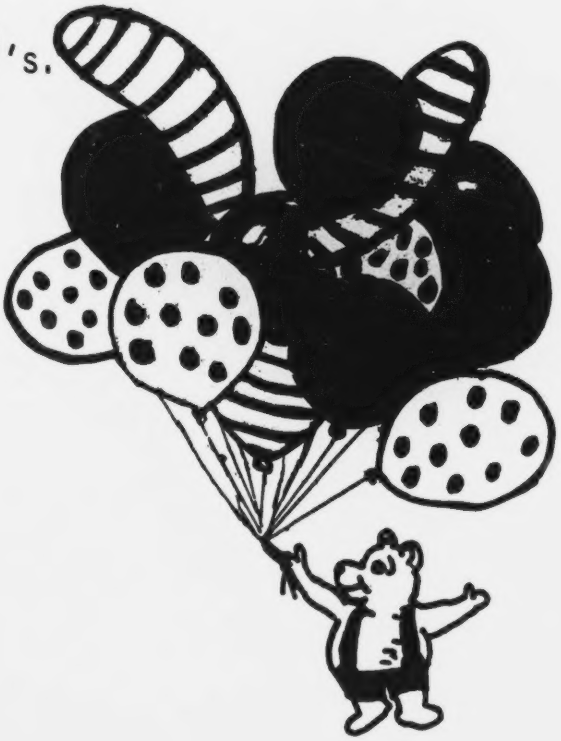


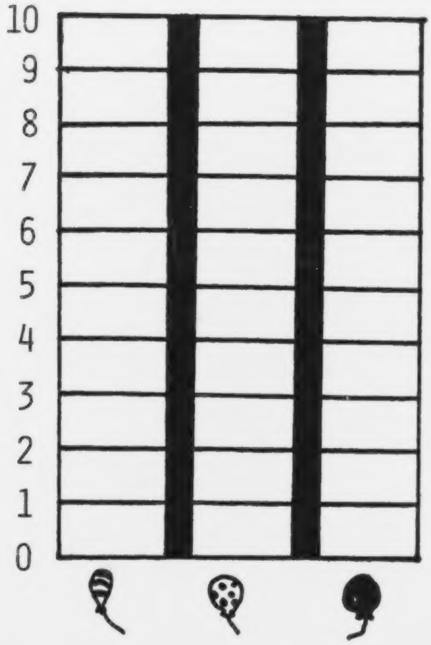
ANSWER: SHE HAS _____ EGGS LEFT.

★2. BOB'S DAD TRAVELS TO DIFFERENT TOWNS EVERY DAY. HE LEAVES AT 6:00 A.M. EACH MORNING AND RETURNS AT 7:00 P.M. EACH EVENING. HE TRAVELED 70 MILES ON MONDAY MORNING AND WENT 25 MILES MONDAY AFTERNOON. HOW FAR DID HE GO ON MONDAY?

ANSWER: _______ MILES

★★★3. MAKE A BAR GRAPH TO SHOW HOW MANY  'S,  'S,  'S.





★★ 4. JIMMY EARNS $1.75 EACH WEEK FOR HIS ALLOWANCE. HOW MUCH WILL HE HAVE AT THE END OF THREE WEEKS?

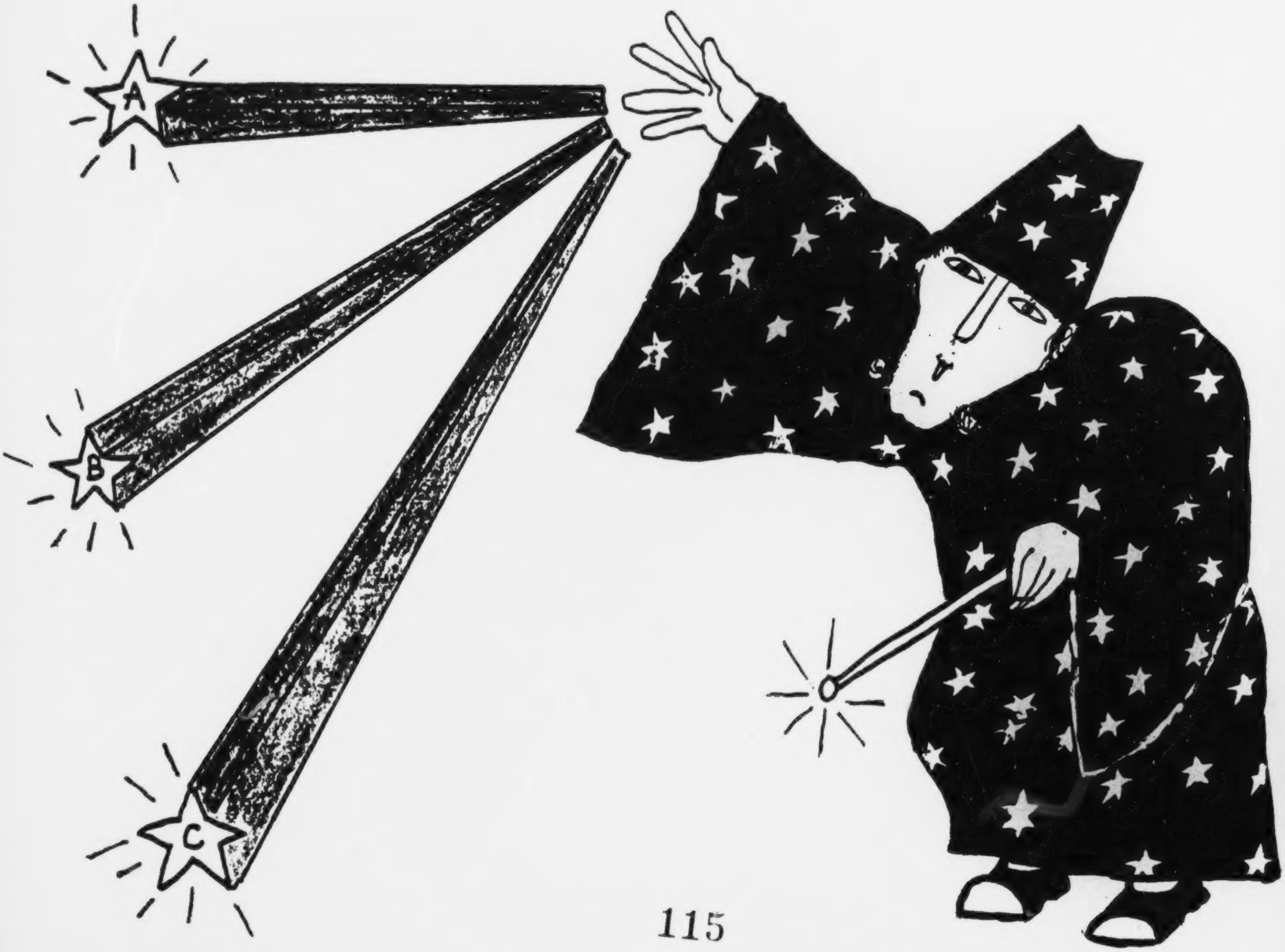
ANSWER: _____

★★ 5. HOW MANY WEEKS MUST JIMMY SAVE HIS ALLOWANCE TO BUY A $10 TRUCK?

ANSWER: ___ WEEKS

★★ 6. USING THE MAGICIAN'S WAND AS YOUR UNIT OF MEASURE, ABOUT HOW LONG ARE THE TAILS OF THE STARS?

ANSWER: TAIL A IS ABOUT ____ WANDS LONG.
TAIL B IS ABOUT ____ WANDS LONG.
TAIL C IS ABOUT ____ WANDS LONG.



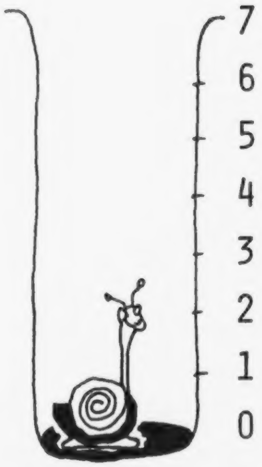
STAR PROBLEMS
GRADE 2, XXV

I DID THIS WORK MYSELF: ____________

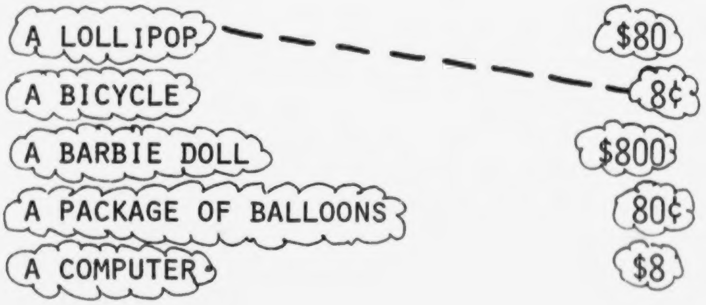
★★★1. A SNAIL FELL INTO A 7 FOOT HOLE. EACH HOUR THE SNAIL CRAWLS 2 FEET UP THE SIDE, BUT THEN STOPS FOR A MOMENT TO REST AND FALLS BACK 1 FOOT. THEN HE STARTS CLIMBING AGAIN. HOW MANY HOURS DOES IT TAKE FOR THE SNAIL TO GET OUT OF THE HOLE?

ANSWER: ___ HOURS

HINT: DRAW A PICTURE OF THE SNAIL'S TRIP.



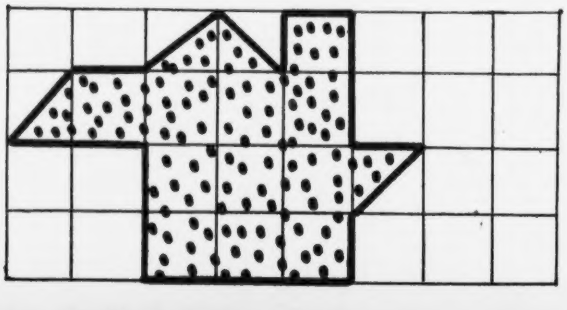
★ 2. DRAW A LINE TO MATCH EACH ITEM WITH HOW MUCH IT MIGHT COST AT YOUR LOCAL STORE. THE FIRST ONE IS DONE FOR YOU.



A LOLLIPOP
A BICYCLE
A BARBIE DOLL
A PACKAGE OF BALLOONS
A COMPUTER

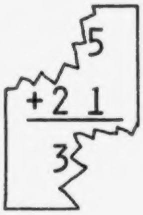
$80
8¢
$800
80¢
$8

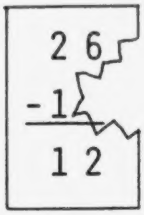
★★★ 3. FIND THE AREA OF THE DOTTED FIGURE BELOW. (THE AREA IS THE NUMBER OF SQUARE CENTIMETERS IT WOULD TAKE TO MAKE THE FIGURE.)

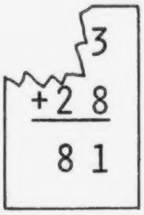


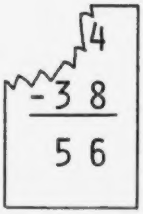
ANSWER: THE AREA IS ___ SQ. CENTIMETERS

★★★★ 4. WRITE THE MISSING DIGITS THAT HAVE BEEN TORN OFF OF THE PAPERS BELOW.

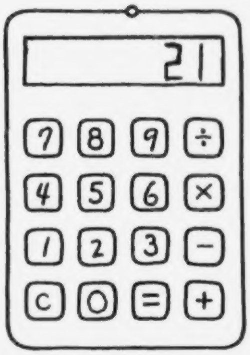








★ 5. JOSIE DID A MATH PROBLEM ON HER CALCULATOR. SHE WAS TRYING TO FIND OUT HOW MANY BIRTHDAYS HER BEST FRIEND HAD CELEBRATED. IF HER BEST FRIEND WAS IN THE SECOND GRADE, COULD THE CALCULATOR ANSWER SHOWN TO THE RIGHT BE CORRECT?



ANSWER: _____ (YES OR NO)

★★★ 6. IT TOOK MARIE 10 MINUTES TO SAW A BOARD INTO 2 PIECES. IF SHE WORKS JUST AS FAST, HOW LONG WILL IT TAKE HER TO SAW ANOTHER BOARD INTO 3 PIECES?

ANSWER: ___ MINUTES

★★ 7. IF YOU COUNTED THE KIDS AHEAD OF YOU IN THE LUNCH LINE AND GOT 12, AND COUNTED THE KIDS BEHIND YOU AND GOT 8, HOW MANY KIDS WERE IN THE LUNCH LINE?

ANSWER: ____

WORKSHEETS

FOR

GRADE 3

STAR PROBLEMS
Grade 3, I

I have neither given nor received help on these problems: ____________

★ 1. A class of 22 students goes outside to play softball. If there are 9 members on a team, and 4 children decide not to play, how many teams can the class form?

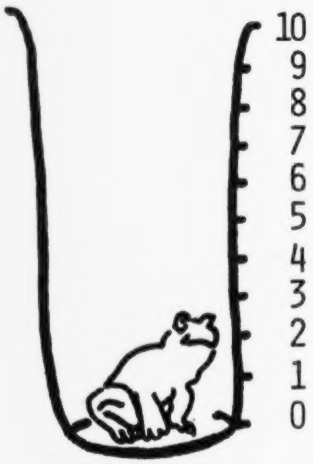
Answer: ____ teams

★★★ 2. A frog fell into a 10 foot well, and started to climb out. Each hour, the frog climbed 3 feet up and then stopped to rest for a moment. But the frog slipped back 1 foot each time it rested.

How long did it take for the frog to climb out of the well?

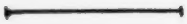
Answer: ___ hours

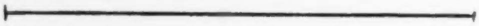
Hint: Draw a picture of his trip!



★★ 3. Tony earns $1.50 each week for helping his father cut the grass and wash the car. If he saves all his money, how much will he have at the end of 6 weeks?

Answer: ______

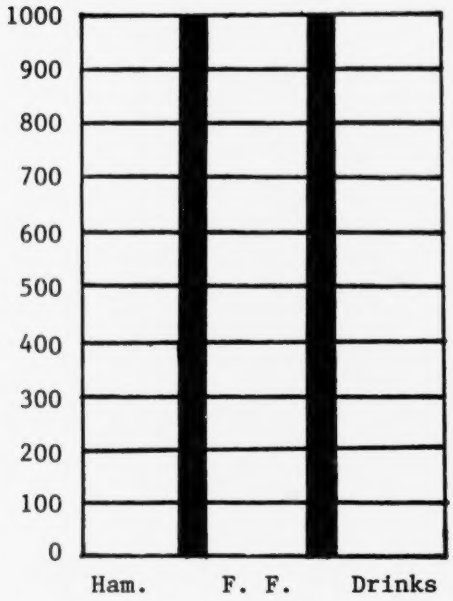
★★★ 4. Cut a strip of paper this long. 

Cut another strip of paper this long. 

Use the strips to measure.

MEASURE	About how many short strips	About how many long strips
Length of this page		
Width of this page		
Length of a new pencil		

★★★ 5. Use the information below to construct a bar graph that shows how many hamburgers, drinks, and orders of french fries a restaurant served altogether last weekend.



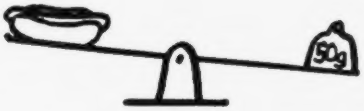
	Hamburgers	French Fries	Drinks
Saturday	450	425	525
Sunday	275	325	450

★★ 6. What is the mass of the hot dog and bun? Circle your answer.

(a) 50 grams

(b) less than 50 grams?

(c) more than 50 grams?



★★★ 7. You have just won $4000 on a quiz show. Without using pencil and paper, practice finding the answers. How much change would you get if you bought each of these items with a $1000 bill?

a. A bicycle for $175. Change __________

b. A new computer for $450. Change __________

c. A new stereo for $825. Change __________

d. Gifts for Mom and Dad for $497. Change __________

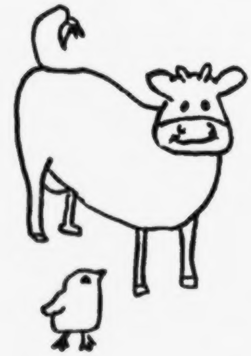
When you turn in your paper, you will be given a problem like this to do completely in your head. So practice some more like this so you'll get the three stars then.

Answer: ____

Star Problems
Grade 3, II

I have neither given nor received help on these problems: ____________

★★★ 1.

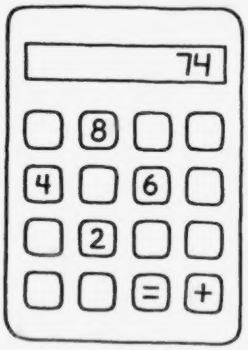


(a) Kim counted 18 legs. She saw 2 cows and ___ chickens.

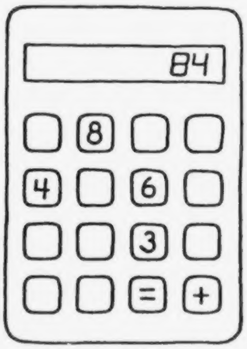
(b) Eric counted 24 legs. He saw ___ cows and 6 chickens.

(c) Sheila saw 5 cows and 3 chickens. How many legs would she count? ___

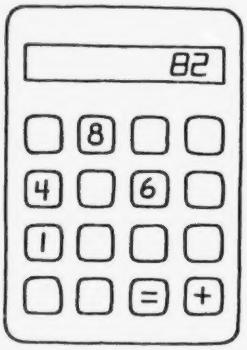
★★★ 2. Each calculator shows the six keys that were pushed to give the answer showing on the display. Figure out what the problem was in each case, and write the equation (like 2+2=4) on the line below each calculator.



____

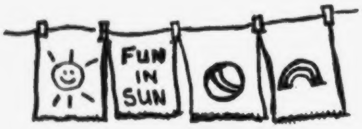


____



____

★ 3. It takes 2 clothespins to hang up 1 beach towel. If you have more than 1 towel to hang up, you can put the edges together as shown in the sketch.



If you have 14 clothespins, how many towels can you hang?

Answer: ___ towels

★★★★ 4. Use the clues to write these prices on the tags: *30¢, 15¢, 10¢, 5¢, and 12¢*

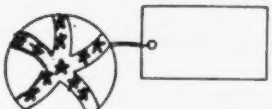
Clues:

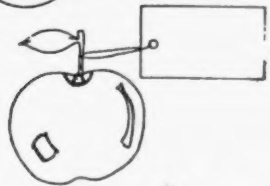
A brush and a car cost 25¢.

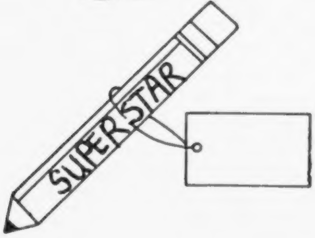
A brush and an apple cost 15¢.

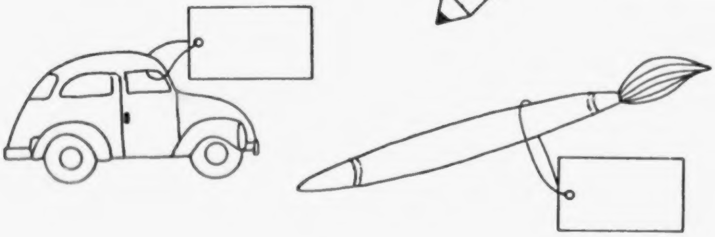
An apple and a pencil cost 17¢.

A ball and a brush cost 40¢.

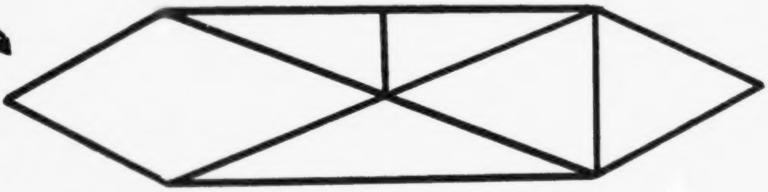


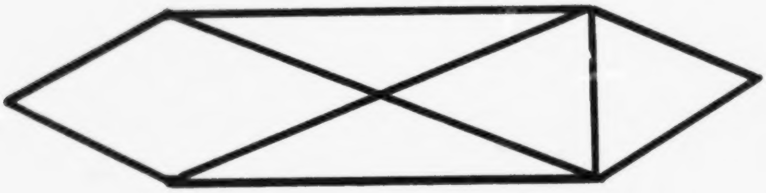






★★ 5. One of the shapes below can be traced without lifting your pencil or tracing over the same line twice. But you have to start in the right place to do it. Find the shape that can be traced like this, and circle the point where you start, with a blue crayon.



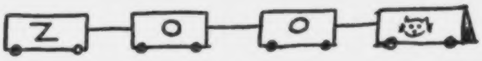


STAR PROBLEMS
Grade 3, III

I have neither given nor received help on these problems: ____________

★ 1. The train brought 6 zebras, 8 elephants, and 4 tigers to the zoo. But the zoo only has enough cages for 15 animals. How many animals will not have a cage?

Answer: ___ animals



★★★ 2. Howard, Jeffrey, Sandy and David are two sets of twins. David is a month younger than Howard. Sandy is a month older than Jeffrey. Which pair is the younger set of twins?

Answer: ________ and ________

★★ 3. Mike wakes up at 6:15 A.M. every morning, and he leaves for school at 7:15 A.M. If he takes 5 minutes to brush his teeth, 15 minutes to take a bath, and 15 minutes to get dressed, how long does he have to eat breakfast?

Answer: _______

★★★★ 4. Solve the following magic squares. For each one, the sum across each row, and down each column, must be the same as the sum along the diagonal.

5		
	6	2
3		7

6		14
	8	
		10

★ 5. Write the following in "standard form," without doing any of the addition shown.

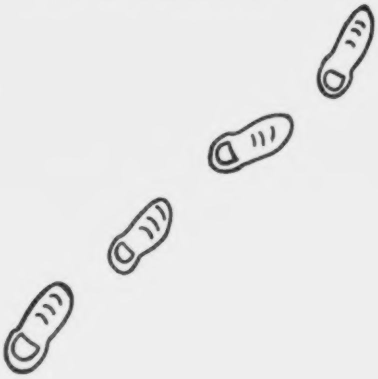
20 + 900 + 7 + 60,000 + 4,000 = ________________

★ 6.

$$\begin{array}{r} 3450028394817238475 \\ -2550028394817238466 \\ \hline \end{array}$$

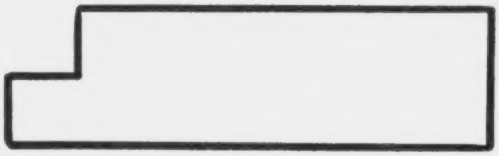
★★★★ 7. Astronaughts landed on the moon and found that they could take much longer steps than they could on earth. Look at the following table and complete the sentences below it.

Astronaut	Feet In Each Step
Long	10
Friendly	17
Carter	15
James	13



Long can cover ___ feet in 6 steps.
Friendly can cover ___ feet in 2 steps.
Carter can cover ___ feet in 3 steps.
James can cover ___ feet in 5 steps.

★★ 8. The *perimeter* of a figure is the distance distance around the outside edge. What is the perimeter of this polygon, in centimeters?

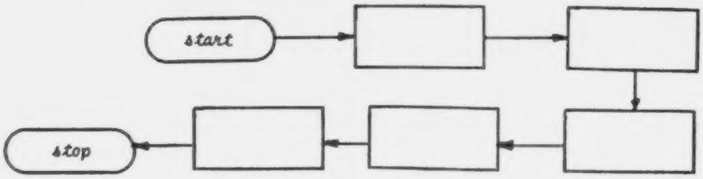


Answer: ___ centimeters

★ 9. Put the letter beside each step below, into the right box in this flowchart:

STEPS
(A) Put on your shoes.
(B) Go to school.
(C) Wake up.
(D) Put on your socks.
(E) Get on the school bus.

FLOWCHART



★★★ 10. You will be asked to do a problem like the one below, in your head, when you turn in your paper. You should practice estimating the answer to this problem, and make up some other problems to practice on by putting different numbers into this problem.

Allen had $5.00 to spend in the toy store. He bought a ball for $1.59 and a top for $0.89. Did he have enough money to buy a toy car for $2.19? Estimate!

Answer later on: ___

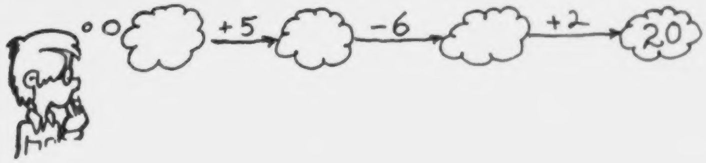
STAR PROBLEMS
Grade 3, IV

I have neither given nor received help on these problems: ____________

★★ 1. Ericka bought 15 orange popsickles and 13 cherry popsickles. On the way home, 4 of them melted and she dropped another one and got it dirty. How many were left?

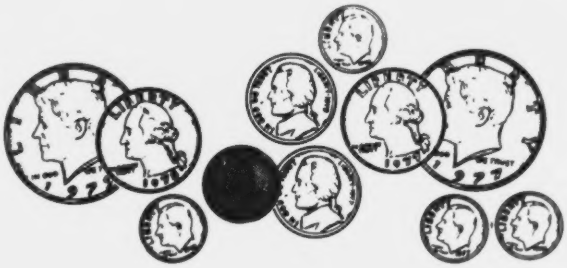
Answer: ________

★★★ 2. Jim thinks of a number. After adding 5 and then subtracting 6, and then adding 2, he got 20. What number had Jim thought of? Write it in the thought cloud next to his head.

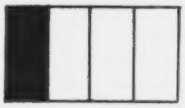


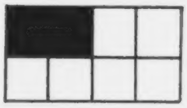
★ 3. How much money altogether?

Answer: ________



★ 4. Write the fraction for each of the shaded figures below. Put the fraction on the blank space.

___ 

 ___

★ 5. Is $\frac{1}{4}$ greater than, less than, or equal to $\frac{2}{8}$? Answer: ______________

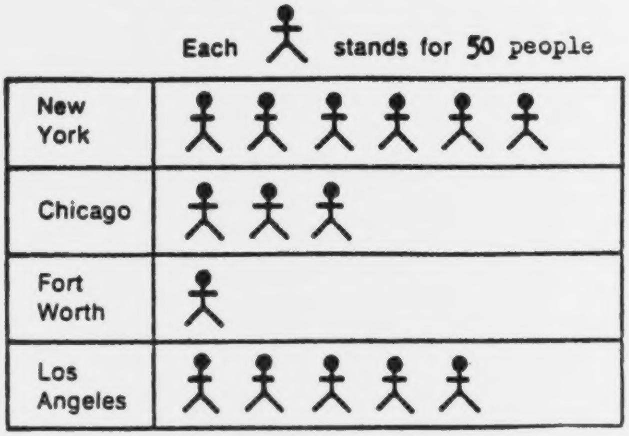
★★★ 6. The *odd numbers* are {1, 3, 5, 7, 9, 11, 13, and so on ...}
The *even numbers* are {2, 4, 6, 8, 10, 12, 14, and so on ...}
Write "odd" or "even" beside each number below, to show which set it belongs to.

15: _____ 16: _____ 23: _____ 34: _____ 100: _____

★★ 7. How many more people are going to Los Angeles than to Chicago?

Answer: ____

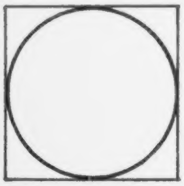
PEOPLE FLYING TO FOUR CITIES



★★★ 8. How many seconds are in 2½ minutes? Answer: ____ seconds

★★ 9. The perimeter of the square to the right is 4 inches--this means it is 4 inches around the outside edge.

Since you know the distance around the square, you can make a good guess about the distance around the circle. Circle the best estimate of the distance around the circle.



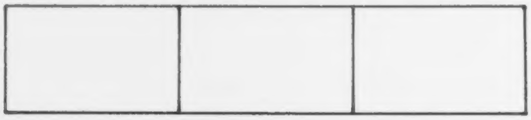
(A) 2 inches (B) 3 inches (C) 4 inches (D) 5 inches

★ 10.

```
  3420673174 5
+  579425936 6
```

★ 11. How many rectangles are there in this figure? Be careful--there's more than 3!

Answer: ___ rectangles

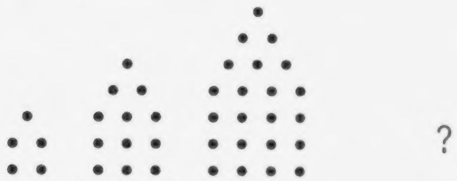


Star Problems
Grade 3, V

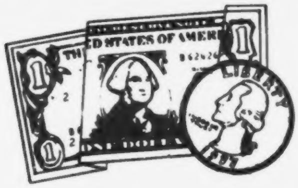
I have neither given nor received
help on these problems: ______________

★★ 1. Look at the shapes below. How many dots will there be in the next such shape?

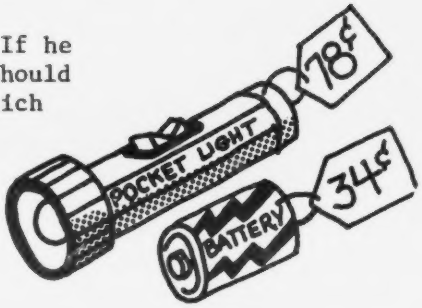
Answer: ___ dots



★★ 2. David earned the money below selling newspapers. If he bought a flashlight and battery, how much change should he receive for his money (don't forget the tax, which would be 6¢ extra)?

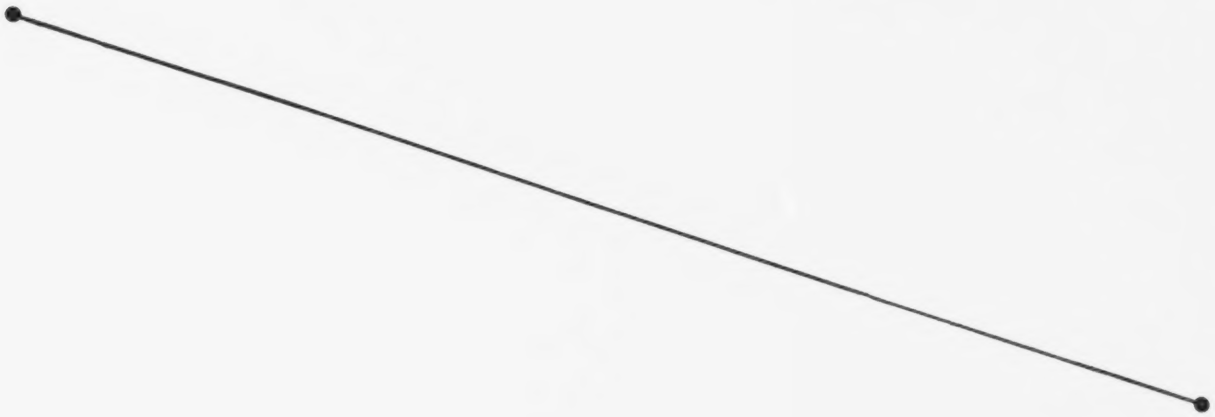


Answer: ____



★ 3. Fill-in the correct number: $96 + \boxed{} = 247$

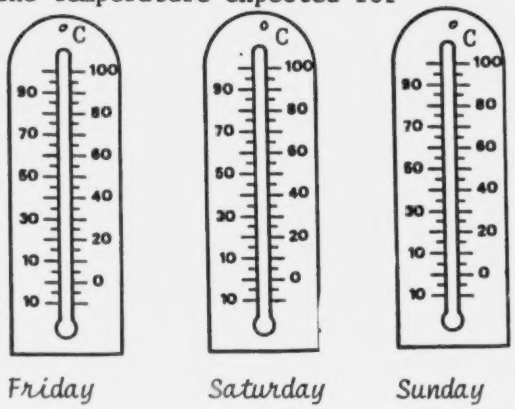
★ 4. Fold this piece of paper so that you *bisect* (cut exactly in half) the line segment below. You can do this if you carefully place one endpoint on top of the other endpoint, before you make the crease.

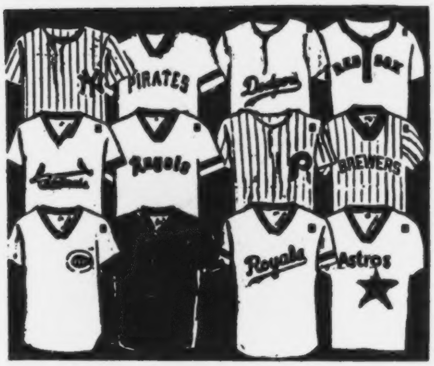


★★★ 5. John heard on the weather report that the temperature expected for the weekend was:

10^0 C for Friday
0^0 C for Saturday
10^0 C below zero Sunday

Draw in the correct temperature on the thermometers to the right.


°C
100
90
80
70
60
50
40
30
20
10
0
10
Friday
Saturday
Sunday


PIRATES
Dodgers
RED SOX
Angels
BREWERS
Royals
Astros

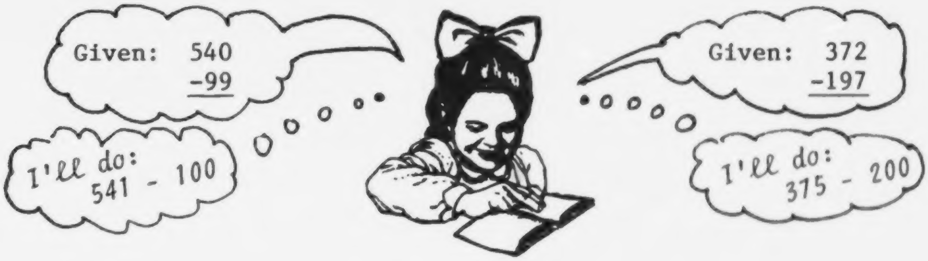
6. For your birthday, your Mom says she'll buy you one of the shirts to the left. If she buys one at random (without picking a special one out), what fraction tells your chances of getting a shirt with stripes?

★★ Answer: ☐

What fraction tells your chance of not getting a striped shirt?

★★ Answer: ☐

★★★★ 7. Sally became a master at doing subtraction problems in her head, without ever "borrowing." She would always do a problem that was slightly different from the one given, but which gave the same answer. Study the pictures below carefully, and then practice this method on the problems below.


Given: 540 -99
I'll do: 541 - 100
Given: 372 -197
I'll do: 375 - 200

Practice problems:

345	526	863	762	682	444	600	800	830
-98	-97	-290	-94	-190	-90	-75	-150	-280

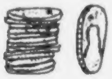
To earn your stars, you'll have a problem like these when you turn in your paper. To earn your stars, you'll have to find a "slightly different" problem, one that's easy to solve in your head.

Answer: Given problem Different problem

Star Problems
Grade 3, VI

I have neither given nor received help on these problems: ______________

★ 1. Guess how many pennies in a pile it will take to be the same height as one penny on edge. Write your guess below, and then try it with real pennies and see if you were correct.



Guess: _____ Real answer: ______

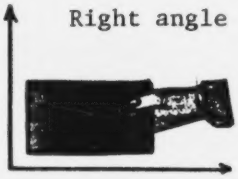
★ 2. Your recipe for making some lemonade calls for ½ cup of sugar. You only have ¼ cup of sugar. If you go ahead and make the lemonade, will it be as sweet as it should be?

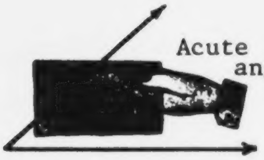
Answer: ______ (yes or no)

★ 3. Write 40,000 + 20 + 3,000 + 300,000 in standard form: __________

★ 4. Write *acute*, *obtuse*, or *right* inside each of the angles below. Use the method shown to the right, to test any that are hard to judge.

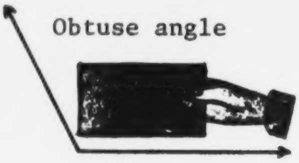
Right angle

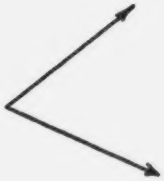


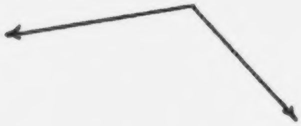


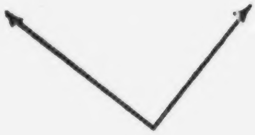
Acute angle

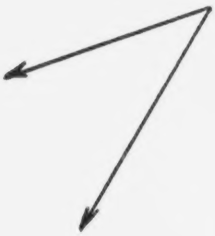
Obtuse angle

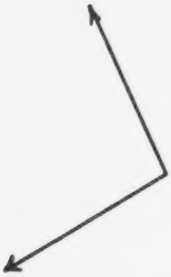


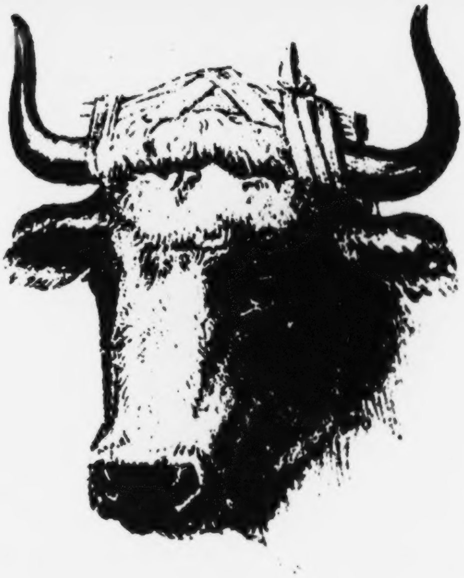






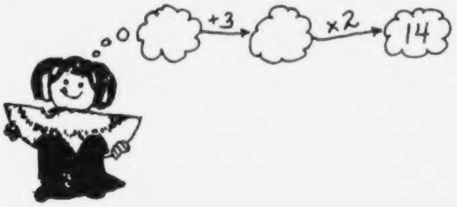






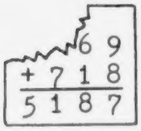
★5. A man's face is hidden in the picture to the left. Circle his mouth to prove you have found him.

★★★ 6. Kim thought of a number. When she added 3 to the number, and then doubled the new number, she had 14. What number did she think of first? Write it in the first thought cloud.



★★ 7. You were standing in the lunch line and noticed that there were 12 students ahead of you, and 8 students behind you. How many students were in the lunch line?

Answer:



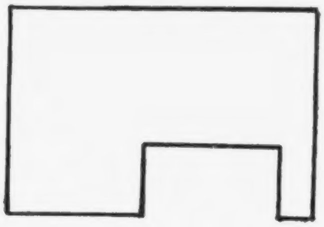
★ 8. Find the missing digits that were torn off the problem to the left. Write them in the correct place.

★ 9. What fraction of a week would be called "school days?" Answer:

★ 10. What fraction of a week would be called "weekend days?" Answer:

★ 11. Which is the largest fraction, $\frac{5}{7}$ or $\frac{2}{7}$? Answer:

★★ 12. Use your metric ruler to find the perimeter of the polygon below:

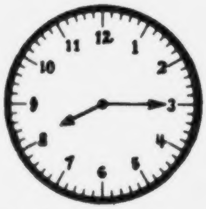


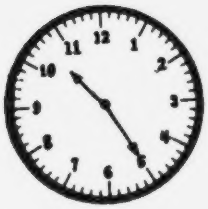
Answer: The perimeter is ____ centimeters.

STAR PROBLEMS
Grade 3, VII

I have neither given nor received
help on these problems: ______________

★★ 1. When Louise woke up Saturday morning, the clock looked like:





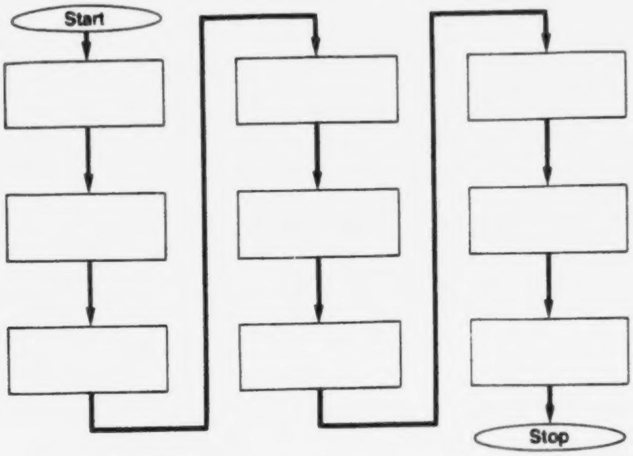
was how the clock looked when she went to bed that night.

How long was she awake on that Saturday? ☐

★ 2. Shannon, Maurice, and Kofi are all the same height, but Shannon weighs 10 pounds more than Maurice. Maurice weighs 68 pounds and Kofi weighs 12 pounds more than Maurice. What is the difference between Maurice's and Kofi's weights?

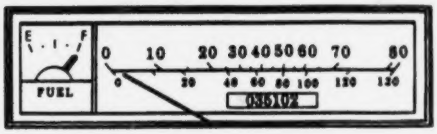
Answer: ___ pounds

★★ 3. Complete the flow-chart below. Beginning with the first box under "Start," place the letter of the alphabet that shows the correct step in writing and mailing a letter to a friend.

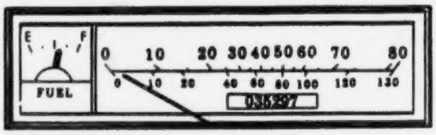


A CLOSE THE MAILBOX	**B** WRITE ADDRESS ON ENVELOPE	**C** PUT LETTER IN STAMPED ENVELOPE
D WALK TO MAILBOX	**E** STOP AT MAILBOX	**F** WRITE THE LETTER
G SEAL THE ENVELOPE	**H** INSERT LETTER IN MAILBOX	**I** OPEN MAILBOX

★ 4. Tamika's family went to her Grandma's house for Thanksgiving. Their car's instrument panel looked like this when they started:


E
F
FUEL
0 10 20 30 40 50 60 70 80
0 20 40 60 80 100 120 130
035102

It looked like this when they arrived:


E
F
FUEL
0 10 20 30 40 50 60 70 80
0 10 20 40 60 80 100 120 130
035297

If their gas gauge was working correctly, could they return home without adding more gas?

Answer: _____ (yes or no)

★★ 5. Figure out how long their trip was, in miles, and *estimate* about how many hours it took if they travelled the whole distance on an interstate highway.

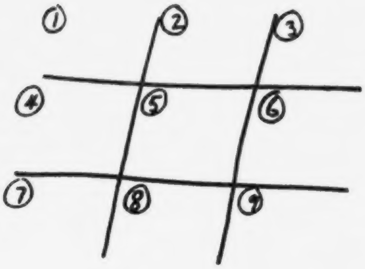
Answer: The trip was ____ miles; it took *about* __ hours.

Hint: The speed limit is 55 miles per hour on an interstate.

★★ 6. Put >, <, or =, in each ○ below, and then in the correct place on the TIC-TAC-TOE board. Do you wind up with a "tic-tac-toe?"

Answer: ___ (yes or no)

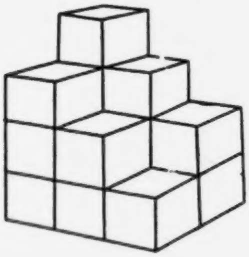
1. 75 ○ 85
2. 12+9 ○ 17+4
3. 3x6 ○ 10+5
4. 33-6 ○ 3x9
5. 15+10+8 ○ 2+2+6
6. 45-8 ○ 30+8
7. 5x5 ○ 10+10+3
8. 88 ○ 30+44+14
9. 15-6-0 ○ 2x4



STAR PROBLEMS
Grade 3, VIII

I have neither given nor received
help on these problems: ____________

★★★ 1. How much will all of the blocks below weigh, if each block weighs 7 grams?



Answer: ________

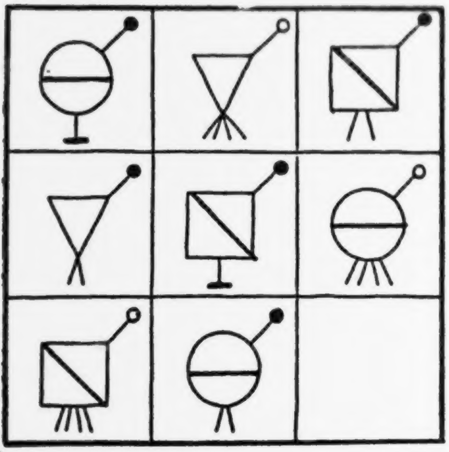
★★★ 2. Complete the square so that the sum of each row, column, and diagonal is the same.

	2	3	13
5	11	10	
9		6	
	14	15	

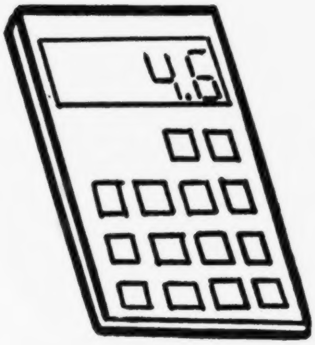
★★ 3. The sum of the digits of a 2-digit number is five. If the digits are reversed, the new number is nine less than the first number. What is the first number?

Answer: ____

★★ 4. Draw the missing figure in the box to the right.



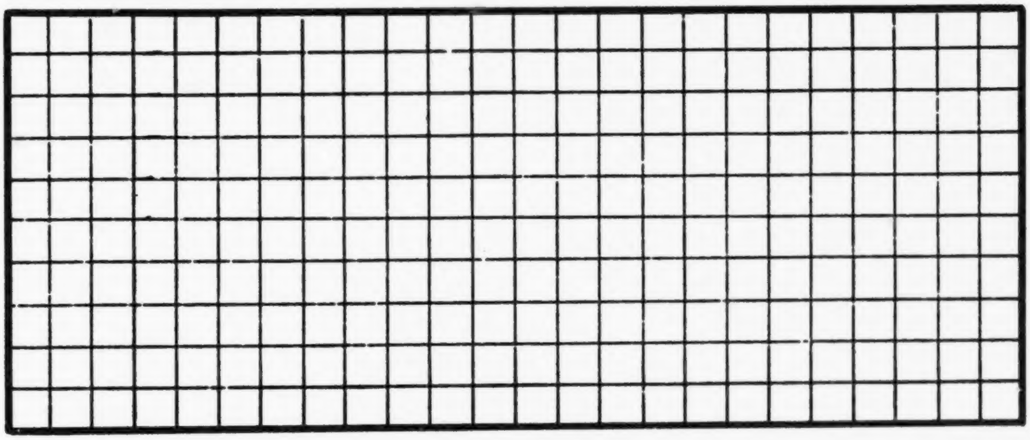
★ 5. Julio added the cost of some things he bought for school on his new calculator. The total is shown on the calculator to the right. How much did he spend?



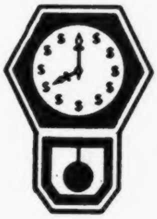
Circle the correct answer:

(a) $4.60
(b) $4.06
(c) $46
(d) $0.46

★★ 6. On the grid below, draw 4 rectangles that have different lengths and widths, but each has area 24. (The *area* is the total number of squares inside the rectangle.)

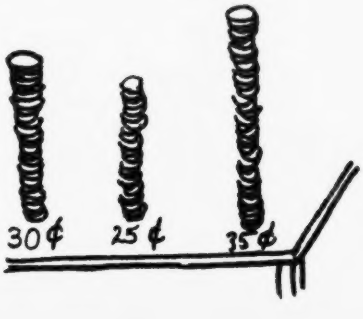


★ 7. Barry found a rusted, antique clock in his Grandmother's attic. How many hours will this 4-day clock run, without winding it?



Answer: ___ hours

★★ 8. Mario had three stacks of pennies--one stack had 30¢ in it, the next stack had 25¢ in it, and the last stack had 35¢ in it. How many pennies would be in each stack if Mario made them all the same height?



Answer: ___

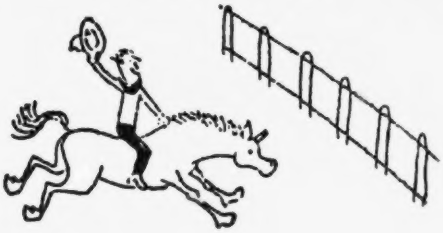
STAR PROBLEMS
Grade 3, IX

I have neither given nor received help on these problems. ________________

★★★ 1. A school bus holds 42 students. It took 4 fully-packed buses, and a car holding 5 extra kids, to get the entire school to an end-of-year party. How many students attended the school?

Answer: __________

★★ 2. Cowboy Joe wants to build a 100-foot long fence for his horses. How many posts will he need if he places them 10 feet apart?



Answer: He'll need ____ posts.

★ 3. Greg's bedtime is 9:00 p.m. He wants to watch television before going to bed. Which show will he be able to finish watching and get to bed on time?

Program	Start:	End:
Knight Rider	9:00 p.m.	10:00 p.m.
Disney Movie	8:00 p.m.	10:00 p.m.
Cartoons	8:30 p.m.	9:00 p.m.
Space Movie	8:00 p.m.	9:30 p.m.

Answer: ________________

★★★ 4. Find the sum. Round your answer to the nearest tenth.

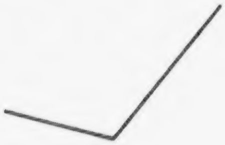
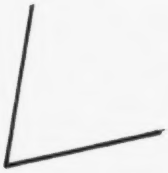
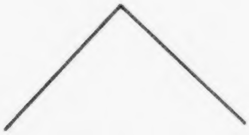
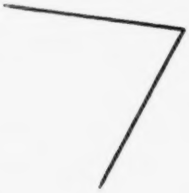
$$\begin{array}{r} 0.22 \\ \underline{+\ 0.56} \end{array}$$

Answer rounded to nearest tenth: _______

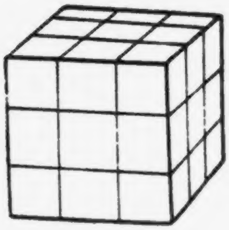
★★ 5. Put the missing digits in the boxes to the right.

$$\begin{array}{r} 4\square,0\square3 \\ \underline{-\ 17,87\square} \\ \square1,129 \end{array}$$

★ 6. Draw a ring around the picture of a right angle.

★★ 7. Count the cubes to find the volume.



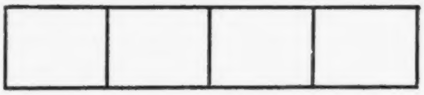
Answer: _______cubes

★★★ 8. Mark counted his pennies one night. When he put them in groups of 4, he had 2 pennies left over. When he put them in groups of five, he had 1 left over. What is the smallest number of pennies he could have, if he has more than 10?

Answer: He has ___ pennies.

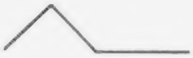
★★ 9. How many rectangles are there in the figure to the right?

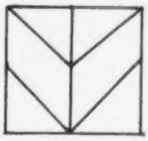
Answer: ____

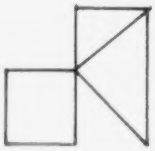


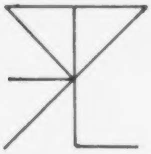
STAR PROBLEMS
GRADE 3, X

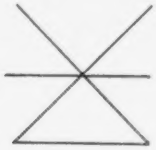
I have neither given nor received help on these problems:_______________

★★★ 1. Circle the figures below which contain this shape: 





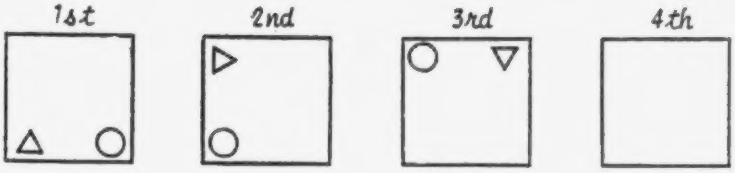




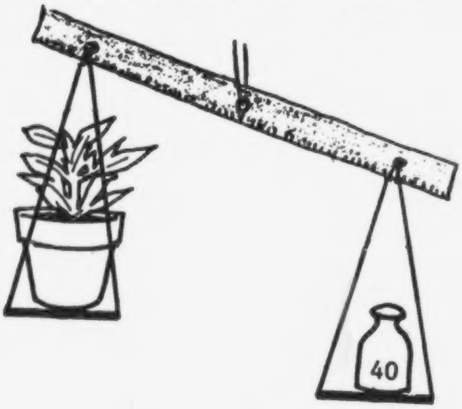
★★ 2. Fill in the missing digits.

```
   3 4 ☐ 1
   8 ☐ 6 0
   5 4 2 ☐
   7 8 0 6
  ---------
 2 ☐ 2 8 0
```

★★ 3. Use the pattern to draw the circle and triangle in the fourth box.



★ 4. What is the mass of the flower pot? Circle the answer.



A. 40 grams

B. less than 40 grams

C. more than 40 grams

★★ 5. School begins at 8:30 A.M. and ends at 2:45 P.M. How many hours and minutes must George plan on being at school?

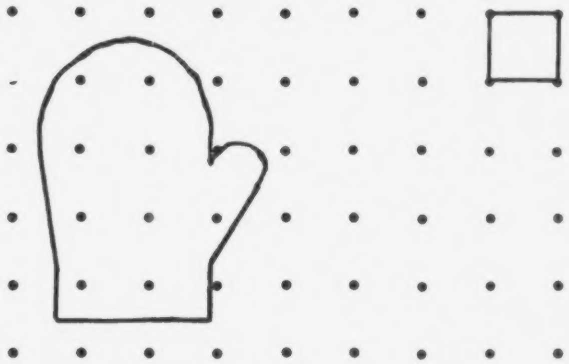
ANSWER ____________

★★ 6. Use a

Bob worked a problem on his calculator. When he turned the calculator upside down, he was surprised to see this message, hIBOB (hi Bob). Which problem made this message? Circle it.

A. $\begin{array}{r} 45547 \\ +35267 \\ \hline \end{array}$ B. $\begin{array}{r} 99777 \\ -18963 \\ \hline \end{array}$ C. both

★★★★ 7. Estimate the area of the mitten if one square unit is equal to one square centimeter. Circle the answer.



A. about 5 squares

B. about 8 squares

C. about 14 squares

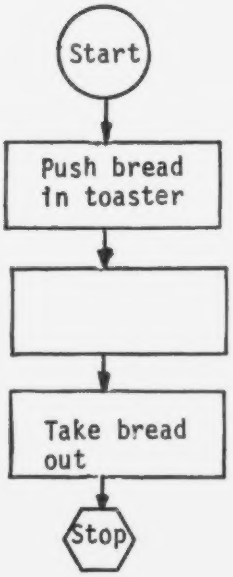
★ 8. Follow the flowchart. When you come to the missing step, choose the activity that best fits the flowchart. Circle the answer.

A. Make a sandwich

B. Wait for the toast to pop up

C. Butter the toast

D. Eat the toast



STAR PROBLEMS
Grade 3, XI

I have neither given nor received help on these problems: ____________

★★ 1. The park is 25 kilometers from Kay's house. The store is 33 kilometers from her house, and the lake is 42 kilometers from her house. How much farther is the lake than the park from Kay's house?

Answer: _____ kilometers

★★★ 2. Ella bought a hamburger, french fries, and a soda. How much, including tax, did she pay for her lunch?

Answer: ______

MENU	
Hamburger......	$1.30
Hot Dog........	.85
Ham Sandwich...	2.00
French Fries...	.75
Milk...........	.50
Soda...........	.50

TAX TABLE

SALE AMOUNT	TAX	SALE AMOUNT	TAX
$ .01-$ .25	$ .01	$1.51-$1.75	$ .07
.26- .50	.02	1.76- 2.00	.08
.51- .75	.03	2.01- 2.25	.09
.76- 1.00	.04	2.26- 2.50	.10
1.01- 1.25	.05	2.51- 2.75	.11
1.26- 1.50	.06	2.76- 3.00	.12

★ 3. Put one of these words into the blank to make a true statement:

celsius *meters* *liters* *grams*

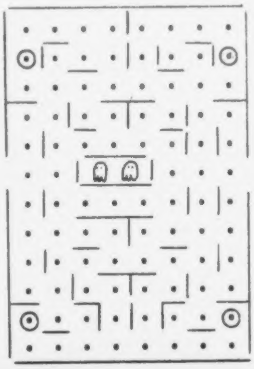
Statement: The mass of a banana would be measured in ____________.

★★ 4. Fill in the missing digits:

$$\begin{array}{r} 4\square{,}6\square 3 \\ -\,2\,0{,}3\,2\,\square \\ \hline \square 9{,}3\,1\,8 \end{array}$$

★★ 5. To the right is a picture of what the PacMan 2 game board looks like. Each · is worth 1 point, and each ⊙ is worth 5 points. If you clear the whole board of dots, without catching a flickering ghost, how many points will you score?

Answer: _____



★ 6. Circle the correct sign to make this number sentence true.

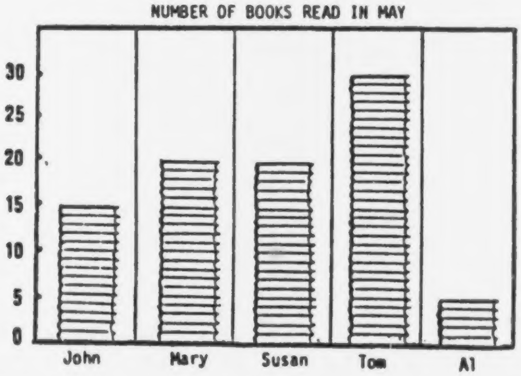
34 - 28 [?] 78 - 69

Answer: > = <

★ 7. Mark left home at 7:30 A.M. It takes him 35 minutes to walk to school. School starts at 8:00 A.M. Was Mark late for school?

Answer: ______

★★★ 8. Use the graph to answer the questions below.



A) Which children read at least 18 books?

Answer: ______________________________

B) How many more books did Mary read than John? ___

C) If Al read 12 books total for May and June, how many books did he read in June?

Answer: _____

★★ 9. Find the answer to this problem by using a calculator.

$$23\overline{)117{,}461}$$

Turn the calculator upside down.

What name does the answer spell? _________

STAR PROBLEMS
Grade 3 , XII

I have neither given nor received
help on these problems: ________________

★★★ 1. Sallie saved her money for three weeks. She saved 30¢ for one week, 25¢ for one week, and 35¢ the last week. What was her weekly average saved?

Answer:________

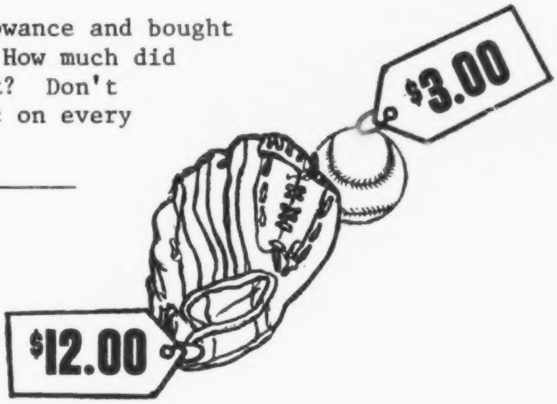
A GOOD FRIEND.

★★ 2. Fill in the missing numerals.

$$\begin{array}{cccc} ⬡ & 3 & ⬡ & 7 \\ - & ⬡ & 8 & ⬡ \\ \hline 1 & 8 & 2 & 0 \end{array}$$

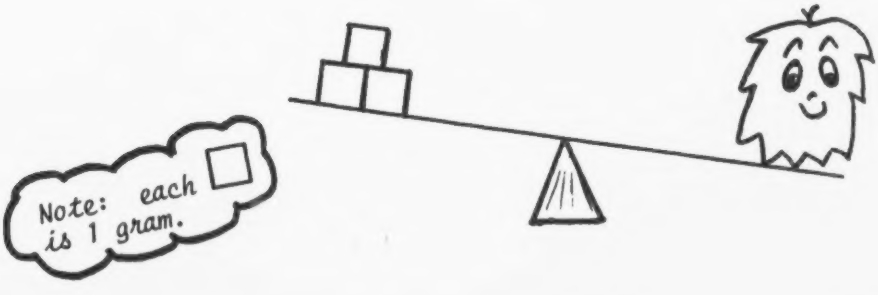
★★ 3. You saved your allowance and bought a baseball and glove. How much did you pay the sales clerk? Don't forget--sales tax is 5¢ on every dollar spent.

Answer:________



★ 4. What is the mass of the friendly Blob? Circle the correct answer.

A. Equal to 3 grams
B. More than 3 grams
C. Less than 3 grams

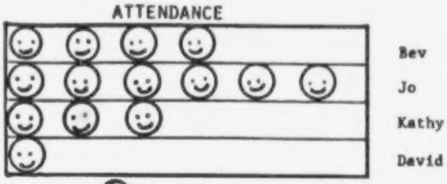

Note: each ☐ is 1 gram.

★ 5. Bob bought a notebook for 89¢ and a pencil case for 93¢. He gave the clerk one five-dollar bill. About how much change should he get back? Circle the best estimate below:

(a) about $1
(c) about $3
(b) about $2
(d) about $4

★ 6. According to the chart, who had perfect attendance?

Answer: ____________



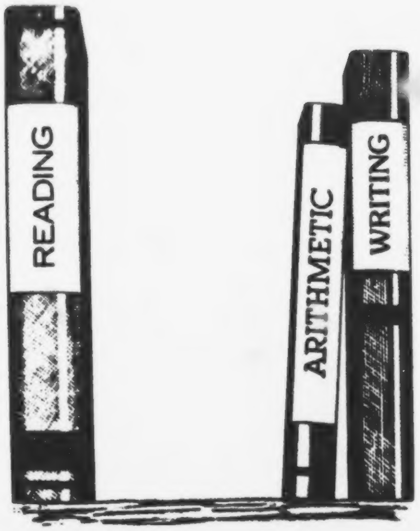
KEY: ☺ = 30 days.
perfect attendance = 180 days

★★★ 7. A dog and cat together weigh 27 pounds. If the dog weighs twice as much as the cat, how much does each weigh?

Answer: The dog weighs ___ pounds.
The cat weighs ___ pounds.

★ 8. Which is heavier, a pound of cotton or a pound of lead?

Answer: ____________



★★★ 9. You opened your reading book and saw that the sum of the facing pages was 53. What were the two pages you opened to?

Answer: ___ and ___

STAR PROBLEMS
Grade 3, XIII

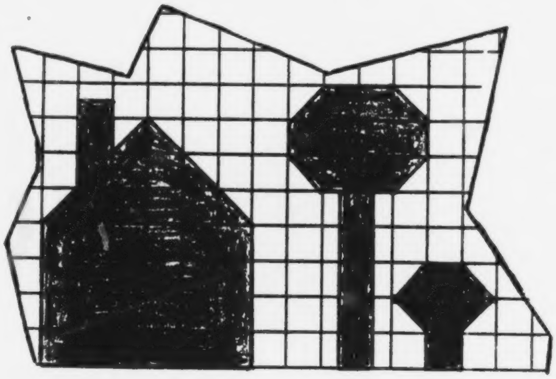
I have neither given nor received help on these problems: ________________

★★★ 1. Find the area of the figures to the right:

Answer: The house is ____☐'s.

The tree is ____☐'s.

The bush is ____☐'s.



ANIMAL	BEATS
house cat	120
grown man	72
elephant	40
whale	20

★★ 2. The chart to the left shows four animals, and the number of times per minute their hearts beat. Look at it carefully, and then fill-in a word below that makes good sense.

A big animal's heart beats ________ than a small animal's heart.

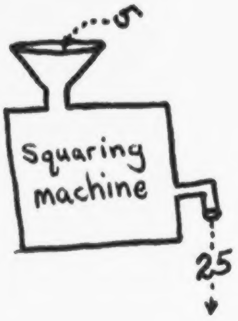
★★ 3. Jane bought a milkshake for $1.39, and paid for it with a five-dollar bill. Circle the correct amount of change she should receive:

(a) 1 penny, 2 quarters, 3 one-dollar bills
(b) 9 pennies, 1 quarter, 4 one-dollar bills
(c) 1 penny, 1 dime, 2 quarters, 3 one-dollar bills
(d) 1 penny, 1 dime, 2 quarters, 4 one-dollar bills

★★ 4. Put the correct symbol (>, <, =) in each circle to the right, to make the statement true.

2+2+2 ○ 2x3
12+11 ○ 21-3
17+56 ○ 100-43
(4+7)-1 ○ 4+(7-1)
2x(6-4) ○ (2x6)-4

★★ 5. Amy has a machine that squares every number that goes into the machine. If 5 goes in, for example, 5x5 or 25 comes out. If 6 goes in, 6x6 or 36 comes out. Fill in the chart to show what numbers come out of the machine:



INPUT NUMBER	OUTPUT NUMBER
1	1
2	4
3	☐
5	25
6	36
7	☐
8	☐

★ 6. The three elementary schools in St. Lucie County have enrollments of 2,413 students, 1,946 students, and 3,012 students. What is the total number of elementary students in St. Lucie County, rounded-off to the nearest <u>hundred</u>?

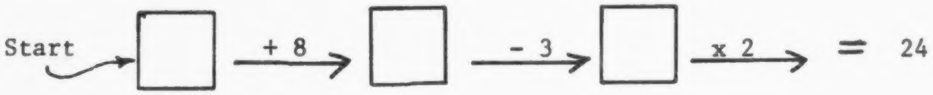
Answer: ________ students

★ 7. What is the answer if you do the steps below, in order?

$318 \times \triangle 4 + 254 - 386 + \boxed{7}$

Answer: ___

★★★ 8. If you start with a certain number, and follow the directions indicated by the flowchart below, you'll get 24 at the last step. What number must you start with? Write it in the first box below.



★★ 9. Do these two problems, please.

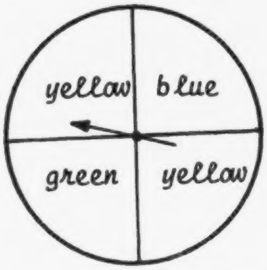
```
  7495057488599770888O1
- 972835108599934902 4
```

```
 837263549385501972 6
 485763994857401237
 56483928374600827
 948573620049856739 9
+279940198463608054 50
```

STAR PROBLEMS
Grade 3, XIV

I have neither given nor received help on these problems:________________

★★★ 1.


yellow
blue
green
yellow

Look at the spinner at the left and answer the following questions.

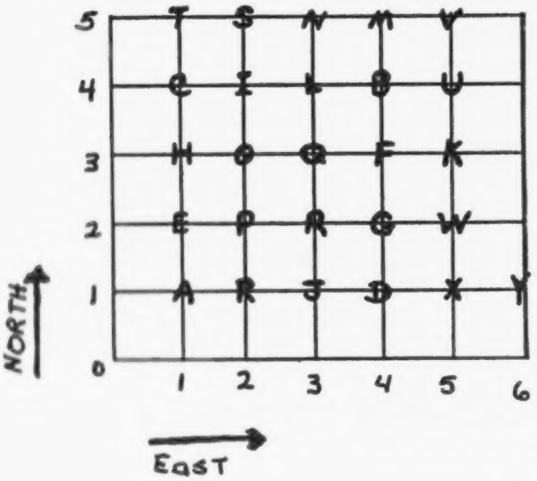
(A) What is the probability that you will spin a green? ____

(B) What is the probability that you will *not* spin a green? ____

(C) What is the probability that you will spin a yellow? ____

★ 2.

Secret Code


T S N M V
C I L B U
H O Q F K
E P R G W
A R J D X Y
5
4
3
2
1
0
1 2 3 4 5 6
NORTH
EAST

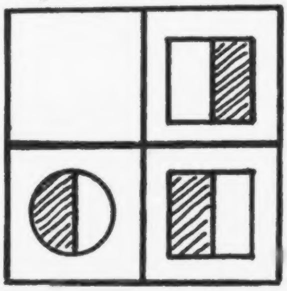
To find out what is for lunch, use the secret code. Go EAST and NORTH to find each letter.

East	North	
1	3	____
2	3	____
1	5	T

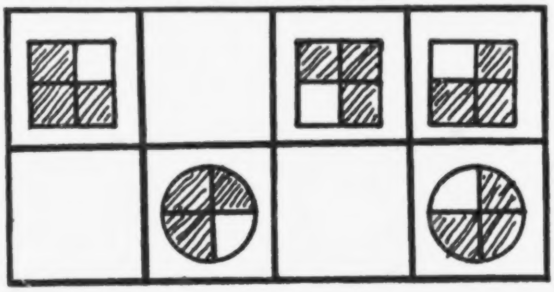
4	1	____
2	3	____
4	2	____
2	5	S

★★ 3. Draw the shapes that are missing in each of the blank blocks below:

(A)



(B)



★ 4. Look for the pattern and fill the missing number in each blank below:

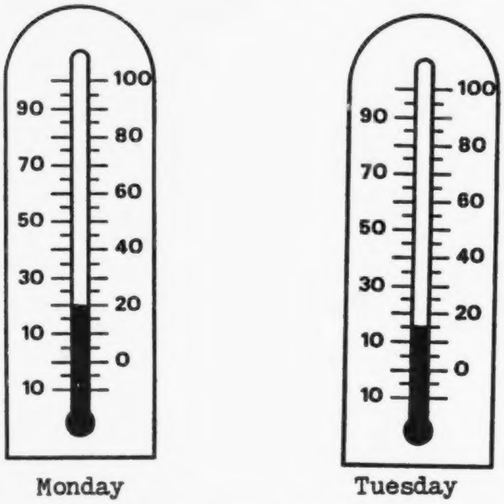
1 4 7 10 ___ 16 ___ 22

★★★ 5. The thermometers at the right show the temperature in Cocoa Beach on two days. Look at each and answer the questions below:

(A) Compared to Monday, did Tuesday's temperature rise or fall? ________

(B) If the temperature on Friday rose 15° above Tuesday's temperature, what temperature would it be? ___

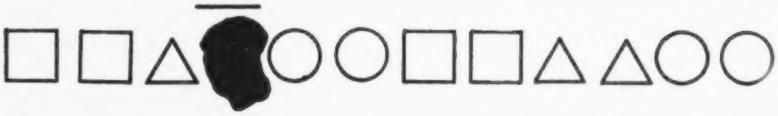
(C) Would you be likely to need a heavy coat Friday? ____



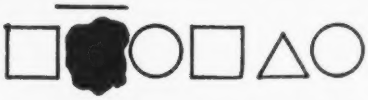
Temperature in Celsius

★ 6. Ink was spilled on the patterns below. On the line above each ink spill, draw the hidden shape.

(A)



(B)



★★ 7. The problem below is an example of an "estimated" answer,

684 estimated to be 700
210 estimated to be 200
+ 397 estimated to be + 400
1300

When you turn in your paper, you will be given a problem like this and asked to estimate the sum in your head. Practice problems like this before then.

Answer goes here as you turn in paper: _______

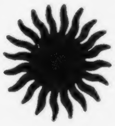
STAR PROBLEMS
GRADE 3 XV

I have neither given nor received help on these problems:

____

★★ 1. The sun shone every day last week. The class kept a record of the hours of sunlight.

Days of the Week	Hours of Sunshine
Monday	10
Tuesday	10
Wednesday	5
Thursday	10
Friday	5

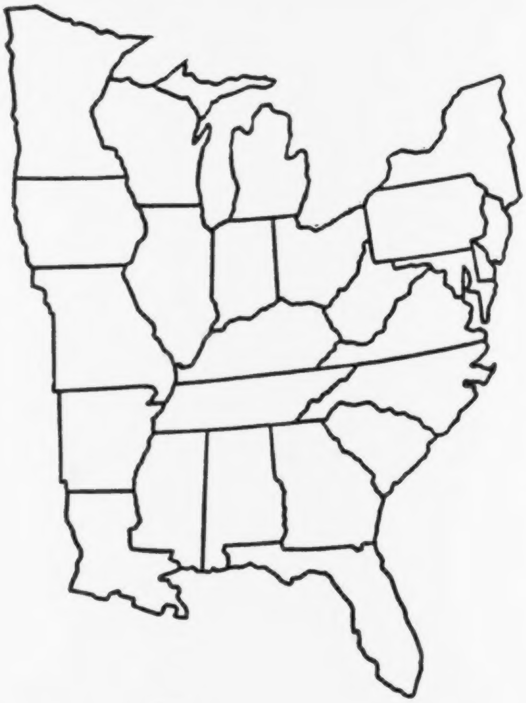


To find the average (mean):

1. Find the sum of the hours.
2. Divide the sum by the number of days.

Answer: average hours of sunshine ____________________

★★★ 2. Use 4 different color crayons to color the map below. No state can be the same color as another state that touches it along a border. Two states can be the same color, if they only meet in a point.



★ 3. What number should the ○ be to make this sentence true?

67 − ○ = 28

Answer: ○ =

★★ 4. Jane noticed that she was a little shorter than half of her friends and taller than half of them. Guess how tall Jane was.

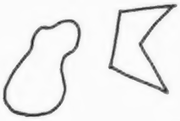
Jane's Friends	Height
Sue	48 inches
Harry	47 inches
Ted	43 inches
Mary	51 inches
Betty	44 inches
Jerry	45 inches

Answer: Jane was __ inches tall.

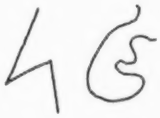
★ 5. If 316 + X = 538 then X must be what number?

Answer: X = ___

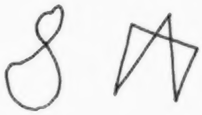
★★★ 6. To be a simple closed curve there must be only one inside and one outside and the curve itself must be closed.



simple closed curves

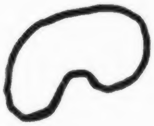


not simple closed curves

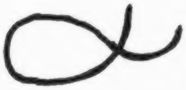


not simple closed curves

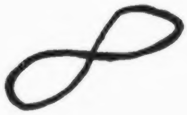
Look at the pictures below. With a crayon color the inside of each simple closed curve. Do not color any curve that is not a simple closed curve.



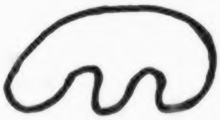
A



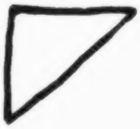
B



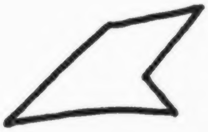
C



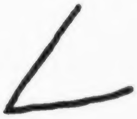
D



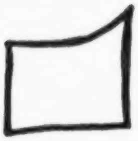
E



F



G



H

Star Problems
Grade 3, XVI

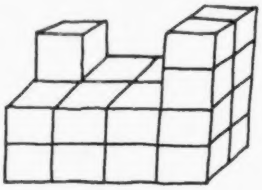
I have neither given nor received
help on these problems: ______________

★★ 1. A cat cost $5.95, and a litter box cost $2.95. Enough food for a month cost $3.98, and enough litter for a month cost $1.89. Estimate how much it cost to buy the cat, and keep it the first month.

○ Between $5 and $10.
○ Between $11 and $16.
○ Between $16 and $21.
○ Between $21 and $25.

★★★ 2. Estimate the cost of buying such a cat, and keeping it for a whole year. Bubble in the best estimate below:

○ Between $170 and $190.
○ Between $55 and $75.
○ Between $80 and $85.
○ Between $100 and $120.



★★ 3. The *volume* of a solid shape is the number of blocks it would take to build it. What is the volume of the solid shape to the left?

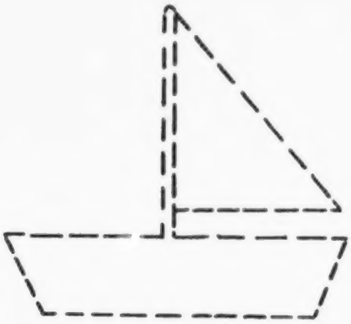
Answer: _____ blocks

★★ 4. Fill in the table to show which coins could be used to equal the total amount. The first one has been done for you, as an example.

AMOUNT	NO. OF COINS USED	QUARTER	DIME	NICKEL	PENNY
32¢	4	1		1	2
26¢	2				
45¢	9				
15¢	2				
19¢	7				
38¢	5				
20¢	2				

★★ 5. The student who did the problems below made the same mistake in each one. Find the mistake, and work the last problem WRONG just like the other three. (Don't get in the habit of subtracting this way!)

$$\begin{array}{rrrr} 46 & 84 & 91 & 63 \\ -37 & -57 & -42 & -25 \\ \hline 11 & 33 & 51 & \end{array}$$



★★ 6. For the boat to the left, use a red pen or crayon to darken-in 2 lines that are *parallel*.

Use a black pen or crayon to darken-in 2 different lines that are *perpendicular*.

★★★ 7. If A = 1¢, B = 2¢, C = 3¢, and so on till Z = 26¢, what would be the value of your principal's last name?

Answer: ________

★ 8. *Odd numbers* are the numbers {*1, 3, 5, 7, 9, 11, 13, and so on*}.
Even numbers are the numbers {*0, 2, 4, 6, 8, 10, 12, and so on*}.

Is the value of your principal's last name an *odd number*, or an *even number*?

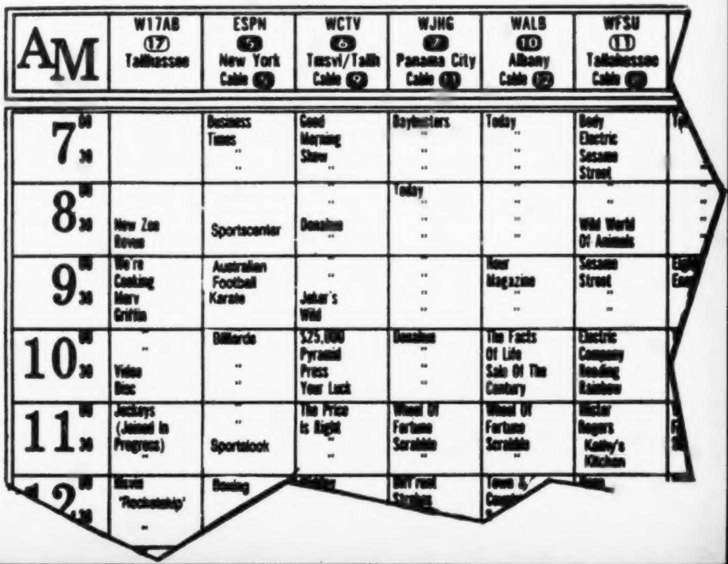
Answer: ____________

★★★ 9. Use the chart to the right to find these answers:

(a) What time does Channel 17 come on the air? _____

(b) How long a program is *Billiards*? ________

(c) How long is *Sesame Street* on the air each day? _____



AM	W17AB ⑰ Tallahassee	ESPN New York Cable	WCTV 6 Tmsvl/Talh Cable 9	WJHG 7 Panama City Cable 11	WALB 10 Albany Cable 12	WFSU 11 Tallahassee Cable
7:00 7:30		Business Times	Good Morning Show ..	Baybusters	Today	Body Electric Sesame Street
8:00 8:30	New Zoo Revue	Sportscenter	.. .. Donahue ..	Today	.. ..	.. .. Wild World Of Animals
9:00 9:30	We're Cooking Merv Griffin	Australian Football Karate	.. .. Joker's Wild	.. ..	Hour Magazine	Sesame Street .. ..
10:00 10:30	.. .. Video Disc	Billiards	$25,000 Pyramid Press Your Luck	Donahue	The Facts Of Life Sale Of The Century	Electric Company Reading Rainbow
11:00 11:30	Jackays (Joined In Progress) ..	.. .. Sportslook	The Price Is Right	Wheel Of Fortune Scrabble ..	Wheel Of Fortune Scrabble ..	Mister Rogers Kathy's Kitchen
12:00 12:30	Movie 'Rocketship' ..	Boxing	[illegible]	Diff'rent Strokes	Town &	[illegible]

STAR PROBLEMS
Grade 3, XVII

I have neither given nor received
help on these problems: ______________

★★ 1. Find an ordinary drinking glass in your house, and make a guess as to whether it's longer around the top than it is high. Then figure a way to measure those two lengths.

Which is longer, the height of the glass, or the distance around the top edge?

Answer: ______________________________

★★ 2. Find a way to put 1, 2, 4, and 7 in the boxes below, to produce a true sentence. Then check your work on a calculator.

$$\boxed{5} \boxed{+} \boxed{} \boxed{-} \boxed{} \boxed{\times} \boxed{} \boxed{\div} \boxed{} \boxed{=} \boxed{1}$$

★★ 3. Now use the same numbers as in problem 2, and find a second way to solve the problem.

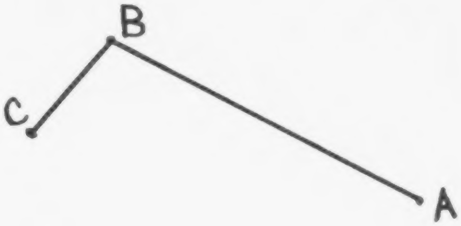
$$\boxed{5} \boxed{+} \boxed{} \boxed{-} \boxed{} \boxed{\times} \boxed{} \boxed{\div} \boxed{} \boxed{=} \boxed{1}$$

★★★★ 4. Bob got $2 each week for cleaning his room, but he spent 25¢ each afternoon after school for a snack. How long would he have to save to buy a stereo tape that costs $8?

Answer: He'd have to save for ___ weeks.

★ 5. If line AB represents ten yards, about how long would line BC measure? Bubble in the best answer.

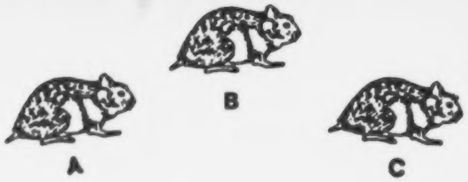
- ○ 2 yards
- ○ 4 yards
- ○ 7 yards
- ○ 12 yards



★ 6. Add, if you have a strong heart!

93
47
35
29
75
33
89
89
45
10
83
15
64
54
92
80
11
83
65
98
37
20
28
39
46
95
34
28
39
47
56
21
39
73
24
47
77
36
48
90
76
23
45
65
68
76
8
+19

★★★★ 7. How many ways can you put these three hamsters into the two cages?



Cage 1
Cage 2

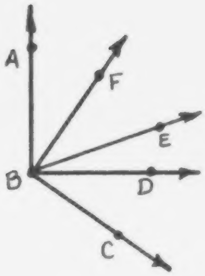
Answer: There are ___ ways to put the hamsters in the cages.

Hint: Make a chart, like:

Cage 1	Cage 2
A,B,C	
A, B	C
⋮	⋮

★★★ 8. Name the three different kinds of angles found in the figure below. Use three letters in naming each angle.

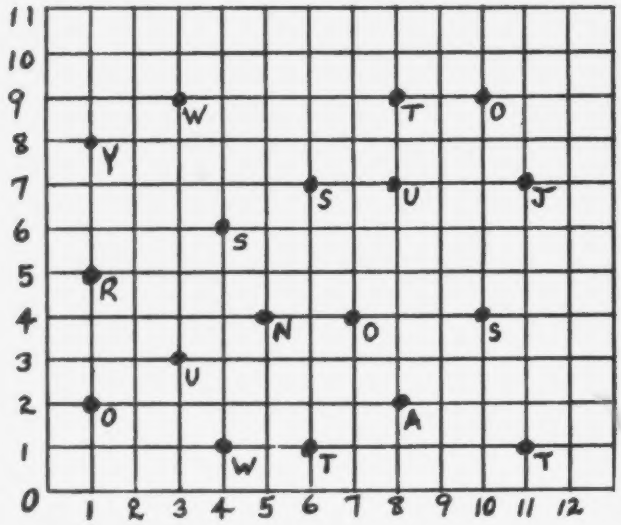
Answer: A *right angle* is: ____
An *acute angle* is: ____
An *obtuse angle* is : ____



★★ 9. Write the letter for each number pair to find out what the teacher is saying.

1st word: (1,8)(1,2)(3,3)
2nd word: (11,7)(8,7)(10,4)(11,1)
3rd word: (3,9)(10,9)(5,4)
4th word: (8,9)(4,1)(7,4)
5th word: (6,7)(6,1)(8,2)(1,5)(4,6)

Hint: To find the letter for (1,8), you go over 1 and up 8!


11
10
9
8
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7 8 9 10 11 12
W
T
O
Y
S
U
J
S
R
N
O
S
U
O
A
W
T
T

STAR PROBLEMS
Grade 3, XVIII

I have neither given nor received help on these problems:__________________

★★★★ 1.

WDOG RADIO STARTING TIMES	
NEWS	9:00 AM
SPORTS REPORT	9:20 AM
MUSIC	9:30 AM
WEATHER	10:55 AM
TALK SHOW	11:00 AM
TRAFFIC NEWS	11:55 AM
OFF THE AIR	12:00 AM

Which show is on the air for the longest time?

Answer:__________________

How many minutes longer is the music program than the sports report?

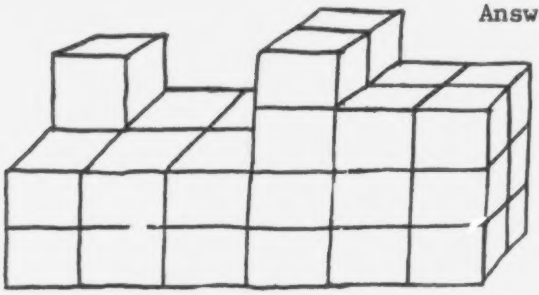
Answer:__________________

★★★★ 2. Alice and Andy are twins. Their Mom is 24 years older than they are. If you add the age of all three of them together-- Alice's age + Andy's age + Mom's age--you get 60 years. How old are the twins?

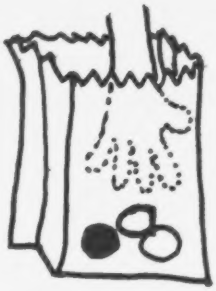
Answer:__________years old.

★ 3. How many blocks were used to make this solid design?

Answer:____ blocks



★ 4.



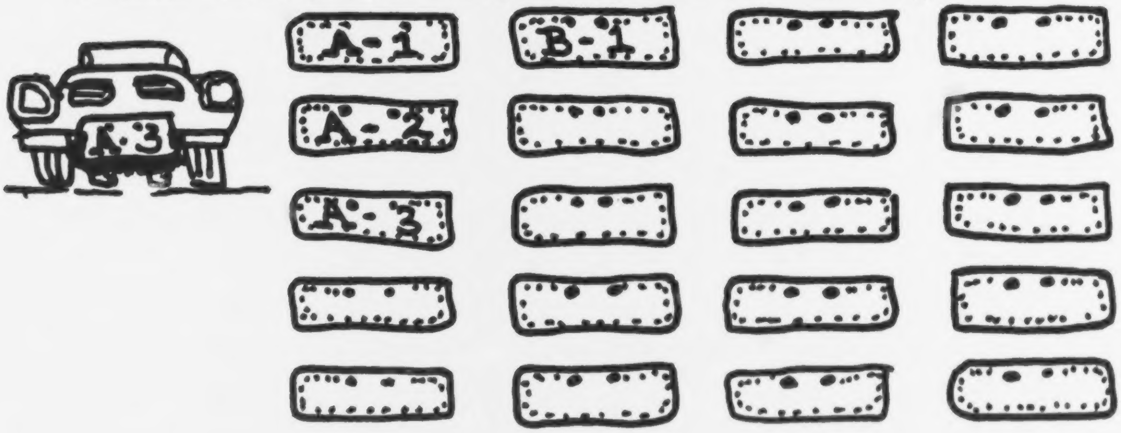
There is a bag with two white marbles and one black marble. Without looking, you take a marble from the bag. What are your chances of NOT getting the black marble?

Answer:_________

★★ 5. If you are 11 years old and I am 36 years old, how old will I be when you are 29 years old?

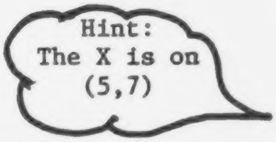
Answer:________years old.

★ 6. In the land of Tuz, each person has one and only one car. The license plate of each car is different and has one letter and one numeral on it. To date, the letters A,B,C, and D have each been used with each of the numerals 1,2,3,4, and 5. Complete the list of license tags.

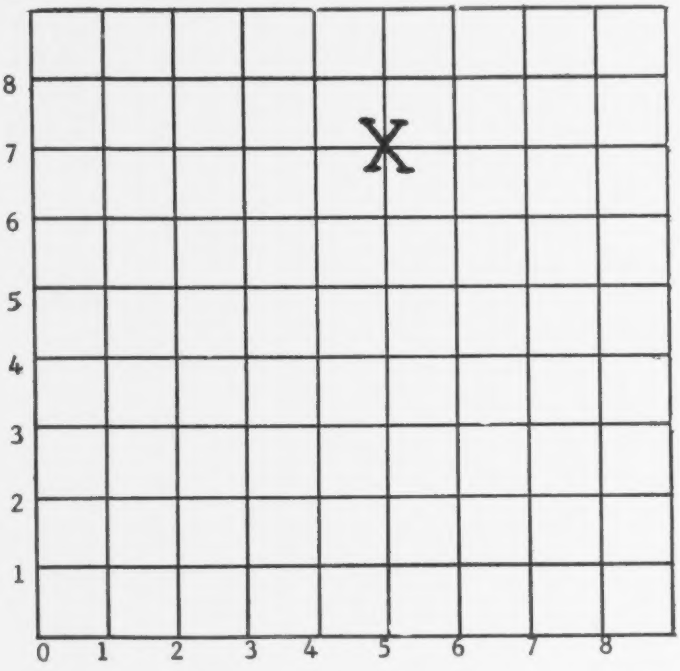


★★ 7. Mark the coordinates and connect them in order.

a. (0,1)
b. (1,2)
c. (1,1)
d. (2,1)
e. (3,2)
f. (4,2)
g. (4,1)
h. (6,1)
i. (5,2)
j. (6,2)
k. (6,4)
l. (8,4)
m. (8,3)
n. (7,3)
o. (6,2)
p. (4,5)
q. (1,5)
r. (0,1)

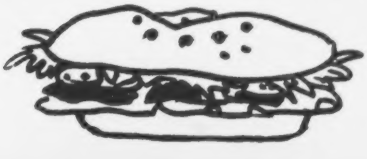


Hint:
The X is on
(5,7)



★ 8. You are going to eat a normal lunch. About how long would you expect your submarine sandwich to be? Circle the answer.

a. 3 cm. b. 25 cm. c. 100 cm. d. 75 cm.



STAR PROBLEMS
Grade 3, XIX

I have neither given nor received
help on these problems: ____________

★ 1. Fill in the missing digits:

$$\begin{array}{r} 9\square82 \\ -38\square6 \\ \hline 5836 \end{array}$$

★★★ 2. Study the number pattern. The dots mean that the numbers continue in this pattern.

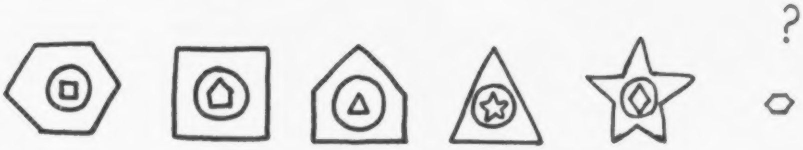
a. Fill in the missing number in the box in column C.

b. In what column is number 22?
Answer: 22 is in column ___.

c. In what column is number 96?
Answer: 96 is in column ___.

.	.	.
.	.	.
.	.	.
.	.	.
9	10	11
6	7	☐
3	4	5
0	1	2
A	B	C

★★ 3. Draw the sixth shape:

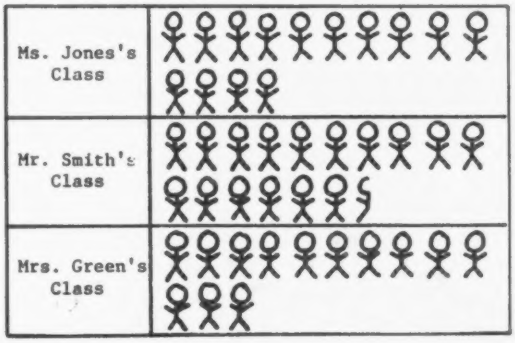


★★ 4. Answer these questions about the pictogram below.

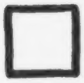
a. How many students are in Mr. Smith's class? Answer: ____

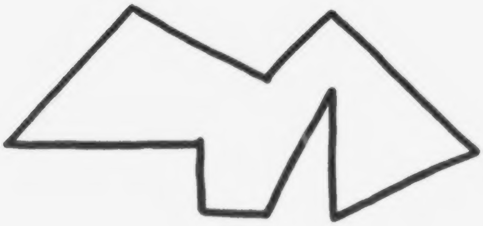
b. How many 3rd grade students attend Center Elementary School? Answer: ____

Third Grade Students in
Center Elementary
School



♀ = 2 students

★★ 5.  is a square centimeter. About what is the area of the shape to the right, in square centimeters?

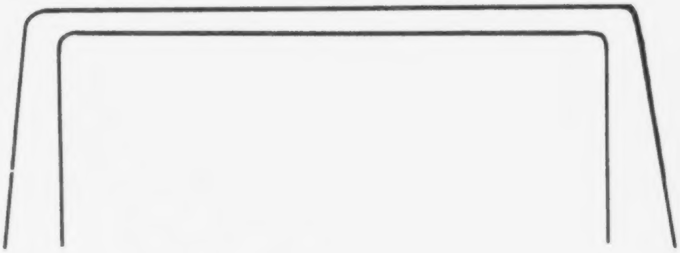


Answer: ___ square centimeters

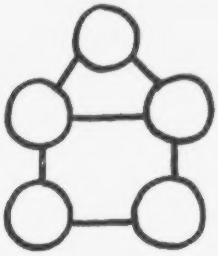
★★ 6. You have put this program into your computer, in BASIC.

```
10 PRINT "HELLO"
20 PRINT "WHAT IS YOUR NAME?"
30 END
```

If you now run the program, what will you see on the display screen to the right?



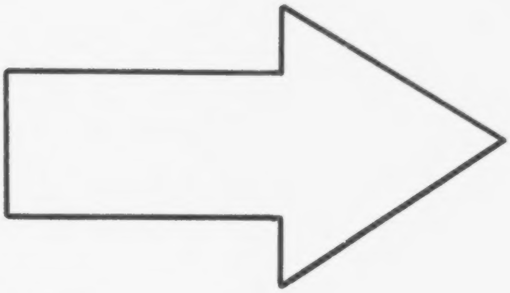
★ 7. Use the numbers 1, 2, 3, 4, and 5. Place them in the ○'s on the figure below. Be sure that no number is connected to its neighbor. For example, 3 cannot be connected to 4.



★★ 8. Using centimeters, *estimate* correctly to fill in the sentences below.

a. The length of the arrow is about ____ centimeters.

b. The perimeter of the arrow is about ____ centimeters.



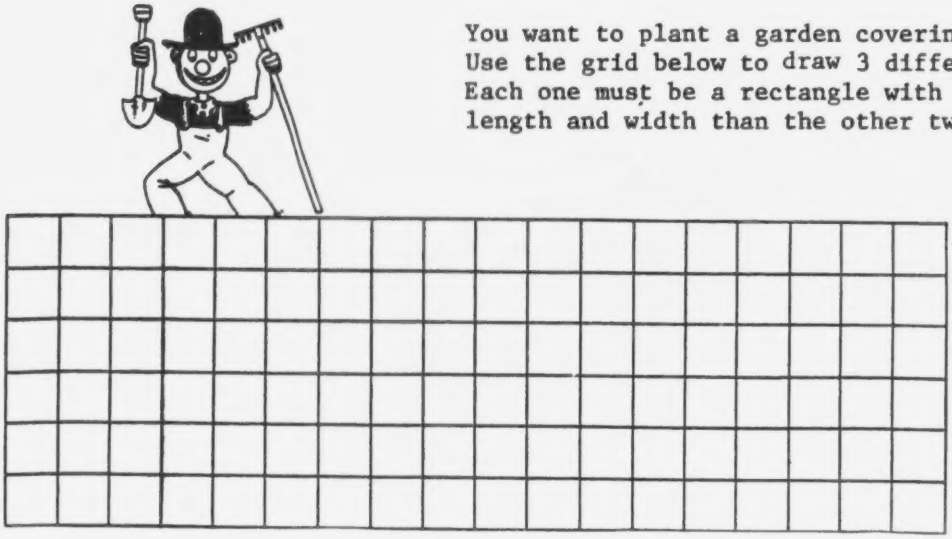
STAR PROBLEMS
Grade 3, XX

I have neither given nor received help on these problems: ____________

★★★ 1. Marvin the Magnificent could pull rabbits out of hats. He could also pull doves from his sleeves. He had 9 hats and (of course) 2 sleeves. One day he got carried away. He pulled 15 rabbits from each hat and 29 doves from each sleeve. Marvin had enough food for 125 rabbits and 75 doves. Use your calculator to decide what Marvin had to buy on the way home.

Circle your answer:
- *a. rabbit and dove food*
- *b. rabbit food only*
- *c. dove food only*
- *d. nothing*

★★★ 2. You want to plant a garden covering 12 □'s. Use the grid below to draw 3 different gardens. Each one must be a rectangle with a different length and width than the other two.



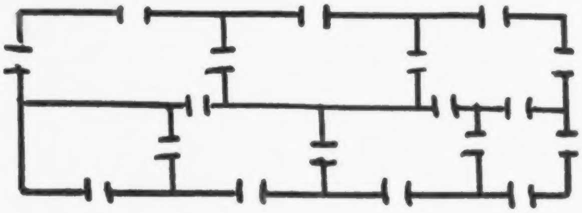
★★ 3. In a baseball diamond there are 90 feet between bases. Airhead McFleetfoot hit a home run out of the park. As he touched second base, he realized he had not tagged first base. After returning to correct his mistake, he completed the trip to home plate. Make and label a diagram to show the path and distance he ran.

MY DIAGRAM

ANSWER

Airhead ran ____ feet.

★★ 4. You can trace a path through the house below so that you go through each door exactly one time. But you have to start in the right room to do so. Find the right room, and make a check mark (✓) there--show your path also. (It's ok for the path to go outside the house, too.)



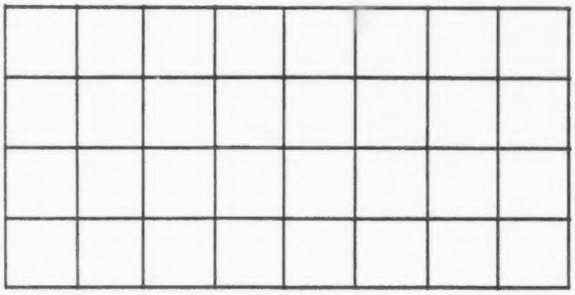
★★★ 5. Toss a coin 25 times and record the number of times it lands on heads and the number of times it lands on tails. Now toss the coin 25 times again and record your results. Use the chart below to record your data.

	Number of heads	*Number of tails*
First: 1 - 25 tosses		
Second: 1 - 25 tosses		

After 50 tosses, the number of heads is closest to which number? Circle your choice.

(a) 10 heads (b) 25 heads (c) 40 heads

★ 6. Cathy poured a handful of M & M's. She got 7 brown, 2 green, 4 orange, and 6 yellow. Make a bar graph to show how many M & M's of each color she had.



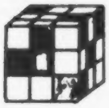
★★★★ 7. Twenty five children are in a class. $\frac{3}{5}$ ate pizza; $\frac{2}{5}$ ate hamburgers. Which answer best fits this class? Circle your choice.

a) 10 ate pizza and 15 ate hamburger
b) 2 ate pizza and 3 ate hamburger
c) 15 ate pizza and 10 ate hamburger
d) 3 ate pizza and 2 ate hamburger

STAR PROBLEMS
Grade 3, XXI

I have neither given nor received
help on these problems: ____________

★★★ 1. Think about a Rubik's cube for this problem, and answer the questions below:



How many of the small cubes have colors on 3 faces? ____

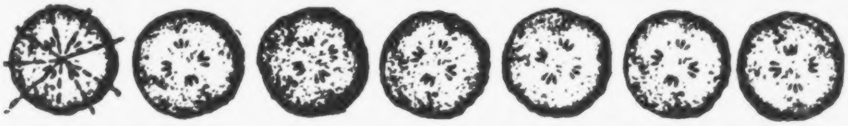
How many of the small cubes have colors on 2 faces only? ____

How many of the small cubes have colors on 1 face only? ____

★★★ 2. Annie has $2.45 in dimes and quarters. She has the same number of dimes as quarters. How many of each coin does she have?

Answer: Annie has ___ dimes and ___ quarters.

★★ 3. The lunchroom baked seven pies. Our class ate $2\frac{4}{9}$ pies at lunch. About how much pie is left? Circle the best answer.



a. 3 pies

b. $4\frac{1}{2}$ pies

c. $5\frac{4}{9}$ pies

d. 6 pies

★ 4. Put >, <, or = between each set of numbers below

a. 2371 + 481 ○ 416 x 6

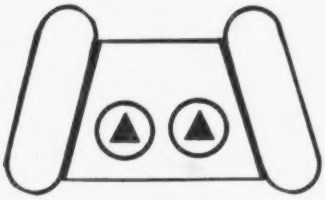
b. 3976 - 225 ○ 3752 x 1

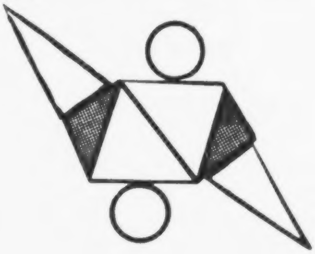
c. 60 ÷ 3 ○ 60 ÷ 4

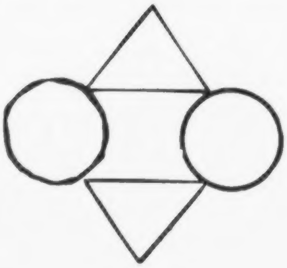
★ 5. Fill in the number that the square is covering up.

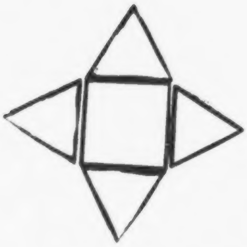
$$642 = \boxed{} + 131$$

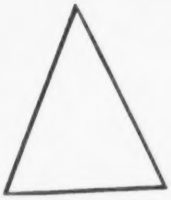
★★ 6. Draw the line(s) of symmetry for each figure. Some figures will have more than one line of symmetry. If there is no line of symmetry, do not mark the figure at all.

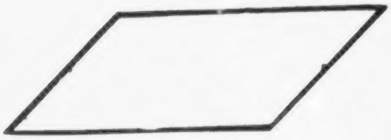




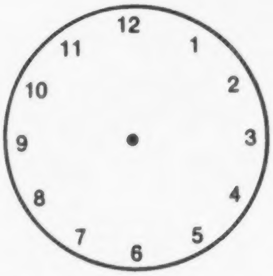








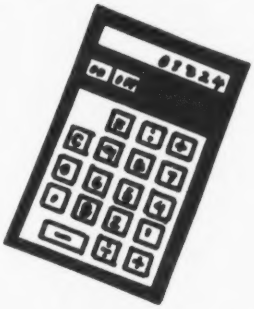
★ 7. John started his homework when he got home from school at 3:30. It took him 45 minutes to complete his work. Draw the hands on the clock to show what time he finished.



★★ 8. Compute the following with a calculator. Turn the calculator upside down. Who is the famous mother written there? Write your answer below.

2 x (4962 + 12541)

Answer:____________________

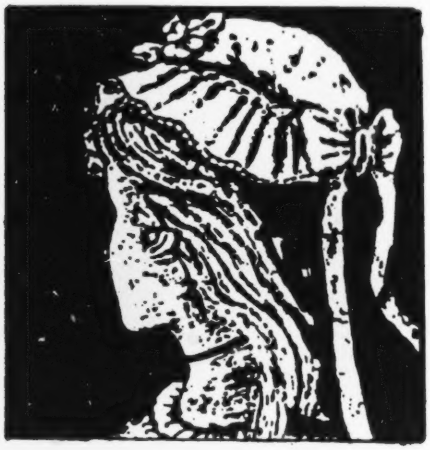


STAR PROBLEMS
Grade 3, XXII

I have neither given nor received
help on these problems: ____________

★★ 1. Stare at the picture to the right until you see 2 different people. One is a young lady with a black ribbon around her neck -- the other is an old witch.

Once you've seen both of them, put a ✓ on the young lady's chin and circle the old witch's mouth.



2.

1 scoop	25¢
2 scoops	36¢
3 scoops	47¢

tax chart

.01 to .20 -------- 1¢
.21 to .40 -------- 2¢
.41 to .60 -------- 3¢
.61 to .80 -------- 4¢
.81 to 1.00 ------- 5¢

★ a. Sam bought one scoop of chocolate ice cream. How much did his ice cream cost with tax?

Answer________

★ b. Jake had 2 scoops of cherry and one scoop of rainbow ice cream. How much did he pay with tax?

Answer ________

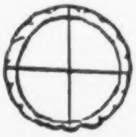
★ c. Paul had a scoop of vanilla and a scoop of raspberry ice cream. How much did he pay with tax?

Answer ________

★★ d. Paul gave the clerk 50¢. How much was his change?

Answer_______

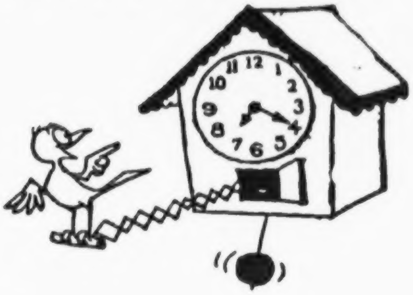
★ 3. Mother baked an apple pie. Dad ate 1/2 of the pie at lunch. Pete ate 2/4 of the pie after school. Who ate the most?



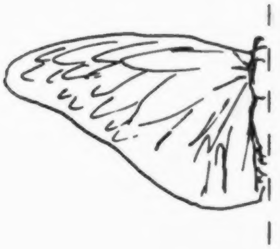
Answer ________

★★★ 4. The cuckoo bird is laughing at the time on the clock. But he wasn't laughing 3 hours and 10 minutes ago. What time was showing on the clock then?

Answer: 3 hours and 10 minutes ago, the time was _______.



★★ 5. Think of a way to draw the matching half for the shape below. Hint: use the line of symmetry shown--you can fold the paper if you want to.



★★★ 6. Find someone who will flip a coin with you for an experiment. Then each of you get a coin, and flip them together forty times and notice on each flip whether your coins *match* or *are different*. (They *match* if you both get heads, or both get tails; otherwise they are *different*.)

Each time you flip the coins, make a tally mark in the first space below. Each time you get a match, make a tally mark in the second space below.

FLIPS: ______________________________

MATCHES: ______________________________

★★ 7. Think about the experiment above, and then choose the best sentence below that describes what happened. Bubble-in your choice.

○ My partner and I got a *match* about one-fourth of the time.

○ My partner and I got a *match* about one-half of the time.

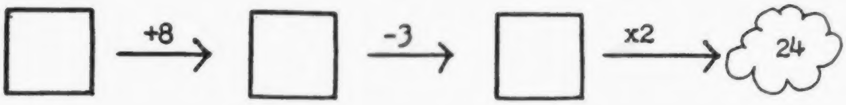
○ My partner and I got a *match* about three-fourths of the time.

○ My partner and I got a *match* almost all the time.

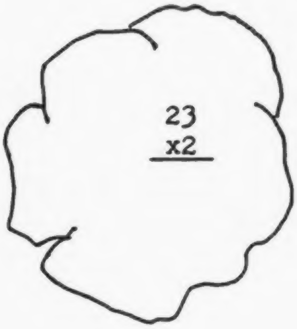
STAR PROBLEMS
Grade 3, XXIII

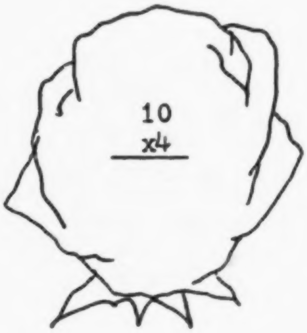
I have neither given nor received help on these problems: ____________

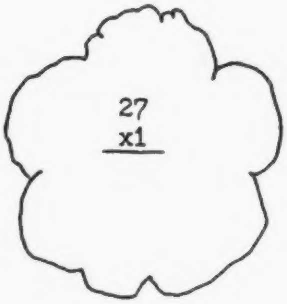
★★ 1. What is the starting number?

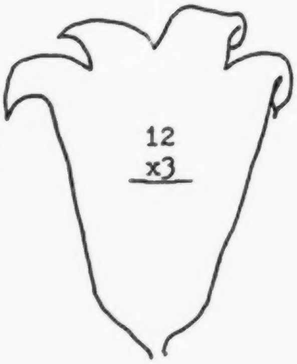


★★ 2. Color the flowers whose products are even numbers.





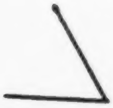
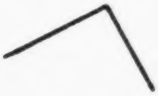
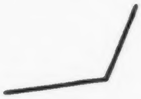
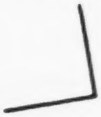
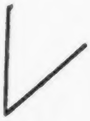
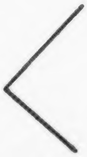




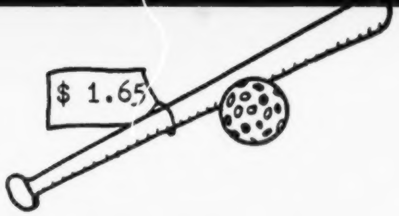
★★★★ 3. Start with the number in the circle. Move across, up, or down. Subtract until you reach the number in the triangle. Draw a line showing the path you will take.

51		
8	7	13
9	6	5
6	8	9
0		

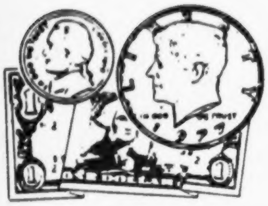
★ 4. A right angle looks like the corner of this paper. Put an X on the angles below that are right angles.

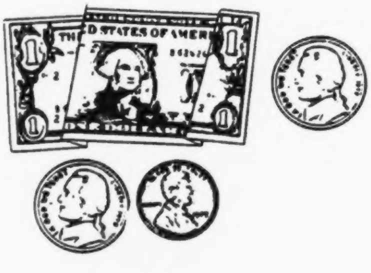







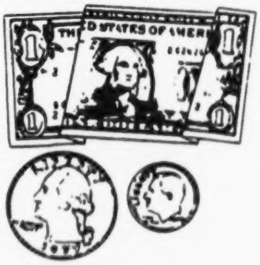
★★ 5. John has $3.00. He buys:

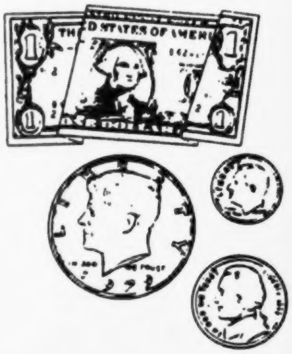


Draw a circle around the group of money below that he will have left.

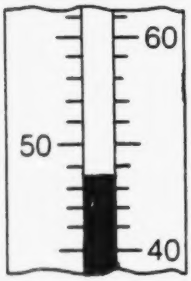








★★ 6. Pretend that this thermometer is hanging on a tree outside your bedroom window. When you looked out in the afternoon the thermometer looked like the one below. Later on that night you looked out again and the temperature had dropped 15°. What was the temperature then?



Answer: ______________

★★★ 7. A bag of marbles has 25 marbles in it, and costs 35¢ at K-Mart. How much will 150 marbles cost?

Answer: _____

★★ 8. Write the missing sign (+, -, x, or ÷) in each circle to make true statements going both across, and down, the puzzle.

6	○	6	=	36
○	■	○	■	○
2	○	3	=	6
=	■	=	■	=
3	○	2	=	6

STAR PROBLEMS
Grade 3, XXIV

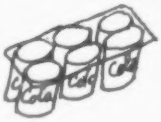
I have neither given nor received
help on these problems: ___________

★★ 1. Circle the letters of the alphabet below that are made only of *line segments*. These will be the ones that do not have any curves in them.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

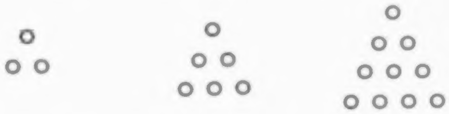
Look now at the ones you circled above. Place a ✓ on any of them where there are *perpendicular* line segments somewhere in the letter.

★★ 2. A can of cola has "354 mL" written on its side, to tell how much cola is in the can. How many milliliters of cola would there be in a 6-pack that costs $1.59?



Answer: ______ mL

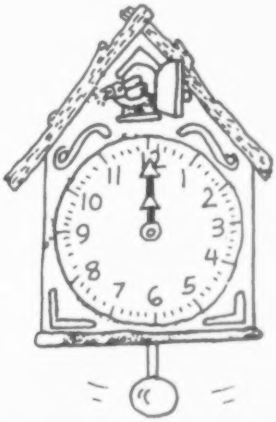
★★ 3. The first few triangular numbers are 3, 6, and 10. Can you see why?

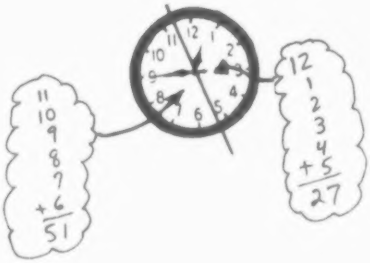


What are the next two triangular numbers?

Answer: ___ and ___

★★★ 4. Draw a line through the clock face below so that the sum of the numbers on each side is the same. An example that *doesn't* work is shown the the far right below.

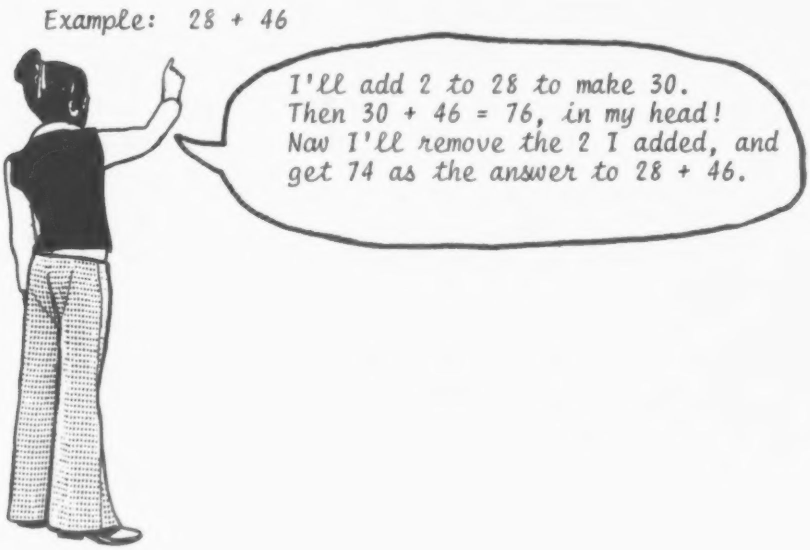




★★ 5. The same digit goes in each box below, to give the correct answer. Write the correct digit in the boxes.

$$\begin{array}{r} \square\square \\ +\,\square\square \\ \hline 1\square 8 \end{array}$$

★★★★ 6. Tamika found a new way of adding numbers mentally. For a problem like *28 + 46*, she would "add a little" to turn one of the numbers into one she could add in her head. Then when she got the answer, she would mentally "take away the little" that she had added. Study how she would do this problem.


Example: 28 + 46
I'll add 2 to 28 to make 30. Then 30 + 46 = 76, in my head! Now I'll remove the 2 I added, and get 74 as the answer to 28 + 46.

Practice adding this way on the problems below. After you have the answer in your head, you can check to see if you are right using your calculator. When you turn in your paper, you'll be given a problem like these and you'll have to find the answer mentally, to get your stars.

Practice problems:

(a) 37 + 46
(b) 48 + 29
(c) 65 + 27
(d) 54 + 28
(e) 46 + 35
(f) 69 + 24
(g) 58 + 26
(h) 29 + 37

Answer for the problem when you turn in your paper: ☐

STAR PROBLEMS
Grade 3, XXV

I have neither given nor received help on these problems: ____________

★★ 1. Find the digit that has been covered up in the problem to the right. Guess the missing digit, and try out your guess by putting it in all the boxes. If you are wrong, revise your guess and try again!

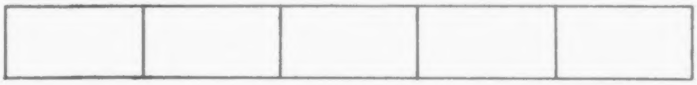
$$\begin{array}{r} 9\,3\,\square \\ 5\,\square\,9 \\ +\,\square\,3\,1 \\ \hline 2\,1\,3\,\square \end{array}$$

★★ 2. Circle the letters of the alphabet that are made only of *line segments*. These will be the ones that do not have any curves in them.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

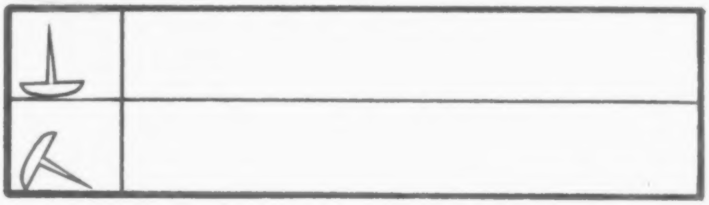
Look at the ones you circled above. Place a ✓ on any of them where there are *parallel* line segments somewhere in the letter.

★★ 3. How many rectangles are there in the figure below?



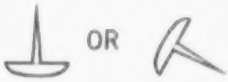
Answer: ___ rectangles

★★ 4. Find a thumb tack and toss it in the air 40 times. Make a mark in the the right place on the chart, to keep up with the way it lands each time.



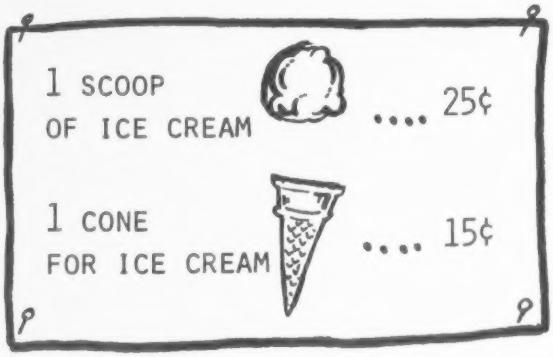
★ 5. Use the information you collected above to answer this question.

If you toss a thumb tack in the air, which way is it more likely to land? Circle the answer below.



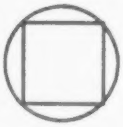
★★ 6. Charles used his calculator and decided that the ice cream cone he wanted would cost a little more than 65¢, once tax had been added. Was his answer reasonable, or do you think he made a mistake on the calculator?

Answer: ______________________________



★★ 7. The *perimeter* of the square below (the distance around the square) is 12 JEXUMS. Which of these answers would be the best estimate of the distance around the circle? Bubble-in the best answer.

○ *10 JEXUMS*
○ *13 JEXUMS*
○ *20 JEXUMS*



★ 8. Shirley got her teddy bear when she was 5 years old, and that was 3 years ago. If the teddy bear cost $14.99, how old is Shirley?

Answer: ___ years old

TEACHER COMMENTARY

(Primary)

STUDENT PERFORMANCE STANDARDS OF EXCELLENCE
IN
MATHEMATICS

1984-85 through 1988-89

Division of Public Schools
Florida Department of Education

MATHEMATICS

STANDARDS	SKILLS - The student will:	GRADE LEVEL(S)
A. THE STUDENT WILL APPLY PROBLEM-SOLVING TECHNIQUES.	1001. Solve word problems requiring multi-step computation.	3 5
	1002. Solve problems appropriate for a table, chart, or list organizational plan.	3 5
	1003. Solve problems appropriate for drawing a diagram.	3 5
	1004. Solve problems appropriate for a guess (or estimate)-check-revise technique.	3 5
	1005. Solve problems appropriate for a working backwards technique.	3 5
	1006. Solve problems requiring visual discrimination.	3 5
	1007. Solve problems involving sequential numeric and geometric patterns.	3 5
	1008. Check the results of a problem-solving attempt in terms of the original problem.	3 5
	1009. Solve word problems that include extraneous information.	5
	1010. Form tentative hypotheses in problem-solving situations.	5
B. THE STUDENT WILL APPLY MATHEMATICS TO EVERYDAY, REAL-WORLD SITUATIONS.	1017. Compute the value of a set of coins and bills, and write it in decimal notation using the dollar sign.	3
	1018. Compute the total cost of several items including tax.	3 5
	1019. Compute the change which would be received in making purchases.	3 5
	1020. Solve problems related to managing personal income.	3 5

B.	(continued) THE STUDENT WILL APPLY MATHEMATICS TO EVERYDAY, REAL-WORLD SITUATIONS.	1021.	Solve problems related to managing personal time.	3	5
		1022.	Solve problems which require interpreting time schedules from a chart.		5
		1023.	Compute the sale price of an item discounted by a fraction.		5
C.	THE STUDENT WILL DEMONSTRATE ESTIMATION AND APPROXIMATION PROCEDURES.	1029.	Estimate the solution to computational exercises involving whole numbers.	3	5
		1030.	Estimate the solution to money problems.	3	5
		1031.	Estimate linear measurements.		5
		1032.	Round any decimal number less than 1, with up to 3 decimal places, to the nearest designated place.		5
		1033.	Estimate the solution to computational exercises involving + and - of mixed decimal numbers.		5
		1034.	Estimate the solution to computational exercises involving + and - of mixed fraction numbers.		5
		1035.	Give reasonable responses based on personal knowledge of a situation rather than rounding and computing.		5
		1036.	Estimate any appropriate measure (length, area), given geometric figures of two dimensions.		5
		1037.	Determine whether or not a proposed answer is reasonable in a given problem situation.		5
D.	THE STUDENT WILL PERFORM MATHEMATICAL COMPUTATIONS.	1046.	Determine the relationship (>, <, =) between expressions using + and - of whole numbers.	3	
		1047.	Add or subtract multi-digit whole numbers, using standard algorithms.	3	

D. (continued) THE STUDENT WILL PERFORM MATHEMATICAL COMPUTATIONS.	1048.	Add or subtract multi-digit whole numbers, using alternative methods.	3	
	1049.	Multiply or divide a 2- or more digit whole number by a 1-digit number.	3	
	1050.	Solve computational puzzles for whole numbers that demonstrate understanding of, and ingenuity with, computational principles.	3	5
	1051.	Determine the relationship (>, <, =), between proper fractions.	3	5
	1052.	Multiply or divide multi-digit whole numbers, using standard algorithms.		5
	1053.	Multiply or divide multi-digit whole numbers, using alternative methods.		5
	1054.	Compute sums, differences, products and quotients in exercises that involve parentheses.		5
	1055.	Add or subtract two mixed numbers.		5
	1056.	Multiply 2 decimal numbers.		5
E. THE STUDENT WILL USE MATHEMATICAL SYMBOLS AND CONCEPTS TO SOLVE PROBLEMS WITHIN MATHEMATICAL SYSTEMS.	1072.	Write the standard base-ten numerals for an expanded numeral.	3	
	1073.	Determine whether any given whole number is odd or even.	3	
	1074.	Solve simple equations of the form $a \pm x = b$ for x a whole number.	3	5
	1075.	Rename a base-ten numeral as a base-two numeral, or conversely.		5
	1076.	Classify the sum, difference, product or quotient of odd or even numbers as odd or even.		5
	1077.	Solve equations of the form $a \bullet x = b$ or $x \div a = b$, for x a whole number.		5

E. (continued) THE STUDENT WILL USE MATHEMATICAL SYMBOLS AND CONCEPTS TO SOLVE PROBLEMS WITHIN MATHEMATICAL SYSTEMS.	1078.	Solve simple algebraic inequalities involving + and -.		5
	1079.	Determine if a given number is prime or composite.		5
	1080.	Write composite numbers as the product of prime numbers.		5
	1081.	Determine the Greatest Common Factor (Divisor) and Least Common Multiple for 2 whole numbers.		5
F. THE STUDENT WILL RECOGNIZE AND APPLY GEOMETRIC CONCEPTS.	1107.	Identify fundamental geometric figures.	3	5
	1108.	Recognize fundamental geometric concepts.	3	5
	1109.	Classify geometric figures.	3	5
	1110.	Recognize and apply topological concepts.	3	5
	1111.	Perform basic line and angle constructions.		5
G. THE STUDENT WILL RECOGNIZE AND APPLY MEASUREMENT CONCEPTS.	1122.	Convert within given units of measuring time.	3	
	1123.	Apply the concept of measuring elapsed time.	3	5
	1124.	Apply the concept of measuring temperature.	3	5
	1125.	Apply the concept of measuring length.	3	5
	1126.	Apply the concept of measuring area.	3	5
	1127.	Apply the concept of measuring volume and/or surface area.	3	5
	1128.	Apply the concept of measuring mass.	3	5
	1129.	Convert given measures of mass to equivalent answers.		5
	1130.	Convert given measures of length to equivalent answers.		5

G. (continued) THE STUDENT WILL RECOGNIZE AND APPLY MEASUREMENT CONCEPTS.	1131.	Determine the degree measure of an angle.		5
H. THE STUDENT WILL COLLECT DATA AND CONSTRUCT, INTERPRET AND DRAW CONCLUSIONS FROM DESCRIPTIVE TABLES, CHARTS AND GRAPHS.	1144.	Read, interpret and construct pictographs.	3	
	1145.	Read, interpret and construct bar graphs, line graphs and tables.	3	
	1146.	Graph ordered pairs of numbers using a Cartesian coordinate system.	3	5
	1147.	Collect, organize and represent data using an appropriate pictograph, bar or line graph, or table.	3	5
	1148.	Read, interpret and construct circle graphs.		5
	1149.	Predict specific outcomes from a set of data, given that the present trend continues.		5
	1150.	Read and determine relationships represented by multiple line and bar graphs.		5
I. THE STUDENT WILL RECOGNIZE AND APPLY THE CONCEPTS OF PROBABILITY AND STATISTICS.	1153.	Collect and record data for a simple probability experiment.	3	
	1154.	Determine measures of central tendency for a set of data.	3	5
	1155.	Use common fractions to describe the probability of an event.		5
	1156.	Use common fractions to describe the probability of the complement of an event.		5
	1157.	Design a simple experiment, collect data and draw appropriate conclusions.		5

J.	THE STUDENT WILL DEMONSTRATE KNOWLEDGE OF CALCULATORS AND COMPUTERS AS APPLIED TO MATHEMATICS.	1166.	Organize, complete, or follow the logic of a flowchart for a daily activity.	3	5
		1167.	Perform the computation involved in a mathematical flowchart with specific input.	3	5
		1168.	Use a calculator to perform computations.	3	5
		1169.	Determine whether an answer on a calculator or computer is reasonable for the given problem.	3	5
		1170.	Demonstrate knowledge of calculator and computer input and output displays.		5

TEACHER COMMENTARY
FOR
GRADE 1 WORKSHEETS

Grade 1 , Worksheet I

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	--	This problem is a simple "union of sets" interpretation of addition. ANSWER: 11
2	--	"Comparison of sets" is the subtraction interpretation for this problem. Students should solve it by matching up the snails and rocks 1-to-1, and counting the extra, unmatched snails. Later on this problem can be interpreted as "7 - 5." ANSWER: 2
3	1020 1144	This problem involves both personal income, and interpreting a pictograph. For the small-group session, you might place a dime over each smiling face, and have the kids count by 10's for similar type problems. ANSWER: 50¢
4	1031	Students can either use a personal unit to represent a centimeter (perhaps a paper clip), or a ruler. In any case, the pictures are close to, but not exactly, whole number units. So the question is "which unit is a picture closest to, in length?" (If students use a ruler, be sure they place the end of the ruler at one end of the picture; it would also help if their rulers did not have millimeters apparent.) ANSWERS: 4, 2, 3
5	--	"Movement on a number line" is the addition interpretation for this problem. ANSWER: 10 + 2 = 12

6	1167	This will likely be the student's initial exposure to a mathematical flowchart. They need to practice with these types of flowcharts--they will be meeting more difficult ones shortly, in succeeding worksheets. ANSWER: 3

Grade 1, Worksheet II

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1002	This problem lays the foundation for solving a non-routine problem by using a chart as an organizer. A similar problem for a problem-solving session would be to take 2 glasses and 6 pencils, and ask the same question. Students can solve this similar problem by actual manipulation of the pencils, and recording their results as they go. ANSWER: A 5 4 3 2 1 0 (Any order is acceptable, B 0 1 2 3 4 5 but each pair of numbers must total 5.)
2	1168 1170	Students are encouraged to use a calculator to solve these exercises since the numbers used are large for addition problems at this stage of the year. Note also that the last one has 3 numbers to be added, and the "+" key must be used twice to find the answer. The answers should be written in the display of the calculator shown. ANSWERS: 15, 12, 14
3	1001	This problem lays the foundation for a multi-step word problem, by presenting two sub-problems and then asking the student to combine the concepts of these sub-problems to gain the final answer. A challenging aspect is that only 3 cows are shown, and 5 chicks, but the problems call for more than these numbers. Students can find the answers by addition, or by counting. ANSWERS: 16, 14, 14
4	1005 1004	This problem involves mentally "working backward" for the student, since he or she knows how much money was spent, and must find out the items that led to spending that much money. Notice that the student might also solve the problem by "guess-check-revise." In your small-group session, you might take the same toys and their prices, but a different sum, and ask them to find the toys. Or you might let students write a problem for the group to solve, using this information. ANSWER: car, drum, boat

Grade 1 , Worksheet III

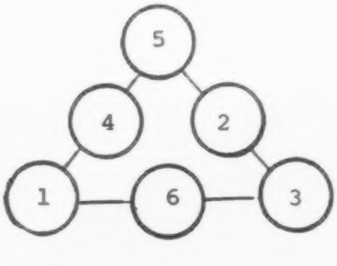
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1004	Students will probably solve this problem by counting (or adding) the numbers that are visible--7,3,2, and 1--and count 4 more times till they get to 17. This is similar to a "missing addend" type problem. They could also solve it by "guess-check-revise" although this is an inefficient way to solve this particular problem. To do so, they would simply guess numbers to go in place of the "?," and add each time to see if they get 17--if not, they revise the guess either up or down. ANSWER: 4
2	1003	Most students will not have difficulty with this, except on Spot's "chest" where it's easy to lose track of which dots have been counted. In a discussion, bring out from students that some solve this by marking off dots as they count them, and some will draw a "dot-to-dot" line to connect them all. If they draw the line, they're beginning to apply the "draw a diagram" problem-solving technique. ANSWER: 48 dots, or 51 dots (if you count the eyes and nose)
3	1128	The purpose of this problem is to cover the concept of mass, in a "balance board" situation. If students have trouble realizing that the lower end indicates a heavier object, have them think of a playground "teeter-totter" situation. Be sure to bring out that a large object is not always heavier than a small one, as in a "balloon, coffee cup" example. They must look at the position of the board to decide. ANSWER: The bunny should be colored.
4	1144	The idea behind the graph is to introduce "pictographs." ANSWER: Florida

5	1001	This is a multi-step word problem involving a real-life situation. The student will probably solve the problem by counting, rather than adding. They will get the total for 1 day, and then count that same amount for 5 days. Note: If a child got 21 as an answer, they probably didn't read carefully or understand about "school days." ANSWER: 15 hours
6	1006 1007	This problem requires visual discrimination as the student searches for the pattern. The hard part of the problem, for some students, is that the numbers are in "descending order." ANSWER: 2 dots, then 1 dot in the boxes
7	--	Students are using several concepts if they correctly solve this problem--ordinal numbers, "left," "last," etc. ANSWER: The 1st star

Grade 1 , Worksheet IV

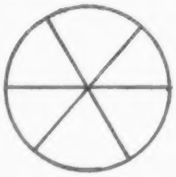
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1107 1006	This problem reinforces the term "triangle" and visual discrimination. Students should be encouraged to look first at the smallest-sized triangles, and count them (4 such). The child can then look for larger-sized triangles, and count all of a particular size he finds, moving up to the largest possible. In this case, the next-sized triangle is the largest possible, so there's only 1 more than the little ones. ANSWER: 5
2	--	This problem lays an intuitive foundation for a word problem, using the partition interpretatiion of division (later in life, kids will solve this problem by "12÷2 = 6"). At this stage, they can solve the problem by drawing lines from the fish to be moved, to the other bowl. Then they can count and see how many they moved. For students who have difficulty, model the problem with an ordinary container, and 10 pencils. ANSWER: 6
3	1001 1006	This problem combines a "story problem" situation, with visual discrimination. Students can find the answers to the two problems by counting, but the challenging part is that they have to count legs and ears that aren't visible. ANSWER: 16 ears 32 legs
4	1050 1004	This computational puzzle requires some ingenuity. The students who solve it will probably do so using some form of "guess-check-revise." One solution is shown below: ANSWER: 

5	1002	This problem is an extension of problem 1, worksheet II. The student is asked to deal with 7 fish instead of 5, and also write the final answer in addition to filling-in the chart. ANSWER: 8 ways
6	1022	This problem gives a chance to talk about "estimating the solution to money problems." The students who get this problem correct probably spend time shopping with their parents, and have gained knowledge through real-world experiences. ANSWER: 2

Grade 1 , Worksheet V

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1007	This problem involves a sequential geometric pattern. The child should notice that the circles are divided into "1 additional piece," moving from left to right. The answer, then, would be a circle that's larger than the last one shown, and which is divided into 6 pieces. (Don't count off if the child didn't make the pieces equal in size, or if he or she didn't draw a true circle.) ANSWER: 
2	1074	The student is to complete this intuitive introduction to an algebraic equation of the form $10 = x + 6$ in which the child "solves for x." If students have trouble with it, check to see if they understand what "=" really means. Then make up some problems like this on 3x5 cards, with all 3 numbers shown, as in $7 = 5 + 2$ Make a square big enough to cover up a number, and go through the cards, covering up a different number, position wise, each time, as in $\boxed{7 = 5 + \square}$ ANSWER: 4
3,4	1124	Both of these problems have students deal with a realistic, measuring situation. The fact that the scale goes up in increments of 5° instead of 1° will give many students difficulty. Go over with them that the intermediate increments are half-way between the multiples of ten, and so they must represent numbers that are half-way between those numbers. Use a much larger thermometer than the one pictured, and have them move their fingers to touch various temperatures you give them. ANSWER: (3) - 0°, 30° (4) - The left-hand thermometer should be marked at half-way between 70° and 80°--the right-hand thermometer at 50° exactly.

5 1019 This problem involves getting change. Students might find the answer either by subtraction, or by "counting up" from $7 to $10, the way a store clerk would do. If students don't have the concept of what "getting change" means, go through some similar problems with the students "acting out" the two roles.

ANSWER: $3

6 1111 Students can be introduced at an intuitive level to geometric constructions in problems such as this. If the student folds the paper correctly, he or she has actually made the "perpendicular bisector" for the line segment. Be sure to show them how to hold the paper up to the light, so they can match up the end points, before making the crease. Then have them measure to be sure the line has been cut exactly in half.

ANSWER: Observe to see if it is correct.

7 1048 This problem has students doing addition problems mentally, using an "easier method" than adding straight down the column. Hopefully they'll realize that mental arithmetic allows them to "play games" with the standard way of adding, and that's necessary at times. Give them this problem which is written out and taped to the table or desk. Have the student work the problem and write answer on his/her paper. Watch and be sure they use no visible crutches--fingers, etc.--and that they only write their answer down, with no intermediate steps:

$$\begin{array}{r} 1 \\ 3 \\ 7 \\ 9 \\ +4 \\ \hline \end{array}$$

ANSWER: 24

Grade 1, Worksheet VI

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1125	The student has an opportunity to demonstrate knowledge about measuring length in this problem, in a challenging manner (for a 1st grader). They will also have to use some "approximation" skills, since the parts of the giraffe do not exactly match up with the lines on the vertical axis. The height of the giraffe is straight forward--13, but for the other lengths, the student will have to either start counting at a number other than zero to find the length, or else subtract the beginning point from the end point. The answers below are approximations. ANSWER: 13 6 (from 7 to 13); perhaps 3 or 4 (neck up to, but not including, the head) 5 (some child might say "20"--counting all 4 legs) 3 (7 to 10) or perhaps 4 (6 1/2 to 10 1/2)
2,3	1072	These problems give students experience with whole number numeration, but in a way different from the usual textbook presentation. Before the student can write the correct numeral, he or she must "reorder the groups," or the numerals, with the hundreds to the left, then the tens, and finally the ones. In the small-group session, go over similar problems, but with real (not pictured) manipulatives. ANSWERS: (2) 256 (3) 184
4	1167	This problem has students follow the steps of a mathematical flowchart. It also "sets the stage" for the higher-level question to follow. ANSWER: 2

5   1004
1005

Students can find the answer to this problem by "working backward." If so, they would start with 12, and ask themselves "what did I have to have in the previous step (before adding 3)?" They would continue this process, "working backward," till they found what number was in the first box.

Note that many of them will also solve this by "guess-check-revise." They'll simply guess a number for the first box, and check it out and see if it works when they add 4, then 2, then 3 and get 12. If not, they will revise their guess to another number.

To help those having difficulty, put some problems like this on 3x5 cards, but with all the numbers included. Take a card at random, and cover up one of the numbers, and have them guess what it is. Check their guess by adding, and then revising the guess up or down.

ANSWER: 3

6,7   1146

These two problems are designed to introduce students to the Cartesian Coordinate system. In going over the problem with students, be sure that they understand that they always go East first, and then North. Tell them that we could have chosen to do the opposite (North first and then East), but a long time ago people decided to all do the same thing, and it was decided that East, then North in that order. At this point, do not push the students into "ordered pairs," but concentrate rather on the concept of moving from "start" to another point, in a standard fashion. Have them follow such trips with their finger.

ANSWERS: (6) 1,3
2,2
4,0
4,3
(7) ●
▲
■

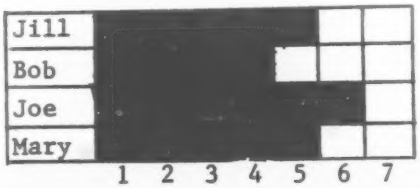
8,9,10 1107 These three problems are actually designed to reinforce the terminology associated with geometric figures--triangle, circle and rectangle. In covering this with a group of students, you might extend the problem cautiously by asking questions such as:

> How many stars are in the rectangle, but not in the triangle?
> How many stars are in both the triangle and the circle? (etc.)

ANSWERS: (8) 8 (if a child answers "3" or "5," they might be looking at one of the smaller triangles. This would be acceptable.)
(9) 13
(10) 6

Grade 1 , Worksheet VII

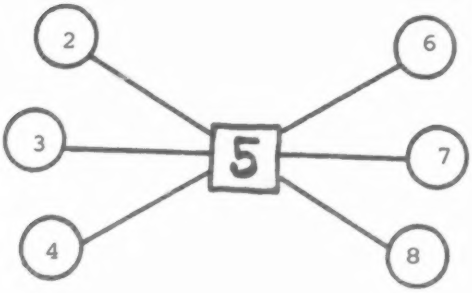
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1017	This problem has students find the value of a collection of coins, and write it using the "¢" symbol. If children are having trouble with this, it might be that they aren't able to see the coins very clearly--start by having them find real coins that look exactly like the pictured ones. At this point, they can find the value of the entire collection by counting (starting with the biggest values first) rather than adding. Or, they can solve this problem by adding the coin values on a calculator. There are 2 quarters, 2 dimes, 2 nickels and 2 pennies. ANSWER: 82¢
2	1019	This problem involves getting change from a purchase. Students should find the answer to this problem by counting the value of coins, to get from 82¢ up to $1, rather than by subtracting. ANSWER: 18¢
3	1046	The student is to fill in a table, using the concept of greater than, less than, or equal to. In going over this problem with the students, note that some will have put "one more than" or "one less than" as the answer to the problems--perhaps they're reading in an extra condition--and others will have enjoyed putting in any answer that will work. ANSWER: Any answers that result in true, line-by-line statements, are acceptable.
4	1145	Making a bar graph is the skill covered in this problem. In your small-group session, do just one of the names as an example, and allow them to finish it later. ANSWER: 

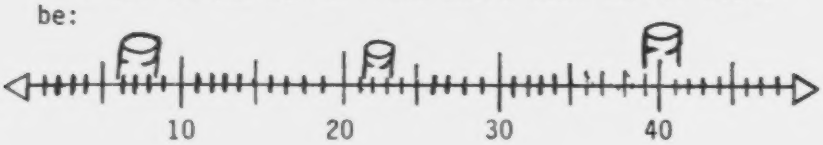
5	1123	"Elapsed time" is being covered in this problem. Most students will recognize 8 o'clock, but some might have trouble with 12 o'clock since the 2 hands are together on the clock. Use a clock with moveable hands, and actually rotate the hour hand from 8 to 12, to show those children having difficulty. ANSWER: 4 hours
6	1031	"Estimating linear measurement" is the skill being covered in this problem. The student might measure the snake with a ruler, without going "around the curves," and get a length of about 8 1/2 cm. If the student follows the snake's body, either with a ruler or with a piece of string to be measured later, they will get a length of about 10 1/2-11 cm. In either case, the answer that's closer than the others is 10 cm. ANSWER: 10 cm. is closer.
7	1006 1128	This problem addresses the skill on visual discrimination--the student must observe closely to notice that the scale is balanced, and that the pans have 1 circle, and 2 squares. Another area involved in finding the correct answer is that of "measuring mass." The student must realize that, since the scale balances with 1 ball vs. 2 squares, the ball must be heavier than the squares. If children have trouble understanding this concept, discuss with them a see-saw in which 2 small kids are on one end, and a big kid on the other. Which is heavier, the one big kid or the two smaller ones? ANSWER: ●

Grade 1 , Worksheet VIII

TEACHER COMMENTARY

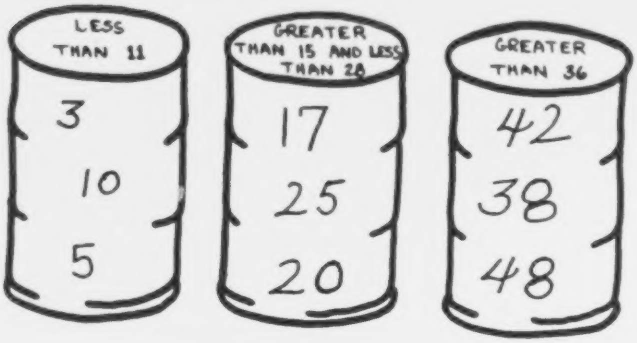
Problem	Skill of Excellence	Comment
1	1006	This problem requires the student to use visual discrimination. Encourage the students to proceed in an organized fashion, such as "count all the smallest triangles first, then move to the next largest size, and keep going in this fashion." ANSWER: 8 (6 small triangles, 2 large triangles)
2	1050	This is a puzzle that requires the student to demonstrate understanding of, and ingenuity with computational principles. In the small-group session, have them start with 2 and put it in any circle. Then have them find the number that has to go with 2 and 5 to give 15 as the sum. Continue in this fashion. ANSWER:  Accept any arrangement just so the numbers in opposite circles total 10. In the answer shown, notice 2+8=10, 4+6=10, and 3+7=10.
3	1126	Students are being introduced to theconcept of area. In the small-group session, stress the term unit square, and introduce the word "area" informally as "the number of unit squares present." Point out to the students how this problem is different from problem 1 since we're talking just about unit squares. Challenge them by asking "how many squares altogether, unit squares and bigger ones also, can you find in the first shape?" (5) ANSWERS: 4, 6, 7 and 19

4 -- This problem involves using the concept of inequalities. You might show them a large number line, and mark off on the number line where each barrel would be:



You might even get more concrete than this by placing glasses on top of a number line with removable numbers, and physically move some of the numbers to the right glass.

ANSWERS:


LESS THAN 11
3
10
5
GREATER THAN 15 AND LESS THAN 28
17
25
20
GREATER THAN 36
42
38
48

Numbers that do not belong in a barrel- 34, 29, 31

5 1006 Students are to solve this problem through visual discrimination. They should notice clues such as the sun shining with the boy stretching, the moon, the clock showing 5 o'clock, etc.

ANSWER:

☐ 1 ☐ 5

☐ 6 ☐ 2

☐ 3 ☐ 4

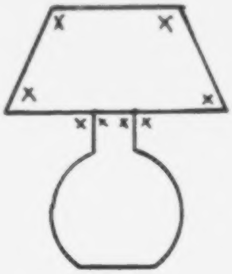
Grade 1, Worksheet IX

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1001	This problem requires multi-step computation. The computation involves adding two numbers and then subtracting to arrive at the answer. The child may solve the problem by crossing out 3 bags, 7 bags and counting the remaining bags. Give several similar problems in the small-group session. ANSWER: 10
2	1003	This problem is designed to have students solve a problem by drawing a diagram, and then counting to find the answer. ANSWER: 8
3	1050	The intention of this item is to have children solve a computational puzzle for whole numbers that demonstrates an understanding of computational principles. Hopefully students in the problem-solving session will notice that different answers are all correct, and conjecture that perhaps any number will work. (Any number will work, since you're adding 4 and subtracting 4.) This problem also uses a flowchart--some children might still need practice on this, even though it was introduced in worksheets I and VI. ANSWER: Any number
4,5	1022	These items require the interpretation of information from a chart. ANSWERS: 4. March 5. April

6 1111 This item requires the child to be able to identify angles. Since the definition is an intuitive one, you'll have to clear up, using similar pictures, (in the small-group session) that several angles may be formed when 2 straight lines meet. In this problem, for example, there are actually 8 angles formed. You will also have to show the students that an angle is not formed by a curved line.

ANSWER:

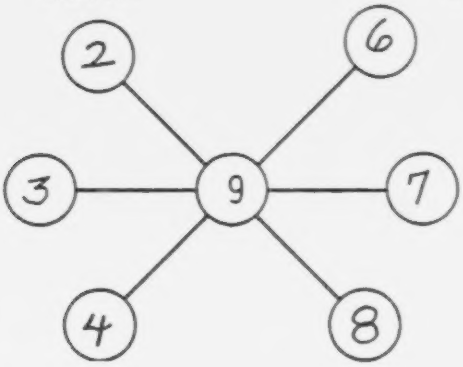


7 -- The child may choose to use repeated addition to arrive at the answer, or count by two's, four times. For students having trouble, demonstrate the problem using 2-liter cola bottles and a large container. Do several pouring problems similar to, but not exactly like, this one.

ANSWER: 8

Grade 1 ,Worksheet X

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1050 1004	This problem requires the student to understand basic computational principles to fill-in the circles. This could be solved by the "guess-check-revise" method. Most students will remember that they did a similar problem a few worksheets back. ANSWER:  ... Accept any arrangement just so the numbers in opposite circles total 10.
2	1128	The student must determine the relative mass of two objects on the balance scale. For students having trouble, have a pan balance available for experimentation. ANSWER: A. tiger
3	1123	This problem involves elapsed time. ANSWER: 10:00 A.M.
4	1108	The concept of lines of symmetry is introduced in this problem. For the small-group session, have a large number of other shapes for students to consider. ANSWER: heart (first figure only)

5	1036	This item provides reinforcement in estimation. Students can decide by making a path out of string from Susan's to George's house. The string will have to be used twice to get from George's house to Barry's. ANSWER: B. about 4 meters
6	1170	The student should use a calculator for this problem. ANSWER: 8
7	1166	This problem is designed to help a student follow the logic of a flowchart. For the small-group session, have some 3x5 cards with steps on them for similar situations, like: Eating an apple. Washing your dog. Making the bed. Getting dressed. ANSWER: eat breakfast

Grade 1, Worksheet XI

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1009	This word problem includes extraneous information (8 hats). ANSWER: 14
2	1009	This problem also involves extraneous information (the yo-yo). Computation uses column addition of 2-digit numerals with no regroupings; students can use a calculator if they want to. ANSWER: 88¢
3	1035	The student must use his personal knowledge of measurement to give a reasonable response. Computation or estimation will not help the student derive an answer. In the small-group session, have models of the metric units given, and let them discuss which makes sense to use here. ANSWER: meters
4	--	This word problem requires the student to read carefully. Hopefully such problems will encourage them to think about each problem, rather than to rely on "key words." ANSWER: 1
5	--	This problem involves the equality symbol in a way that might be new to students. Previously, "=" seemed to mean "do something," as in "7+2=?." But now it means "what's on the left is the same as what's on the right, mathematically-speaking." ANSWER: True

6	1123	The student must apply the concept of measuring elapsed time given in a real-world problem situation. ANSWER: 4:30 P.M.
7	1145	The student must be able to read and interpret a table in this problem. ANSWER: A) 8 B) Purple C) Red
8	1168	A calculator should be used to perform this computation, at the first grade level. ANSWER: 5537 LESS

Grade 1, Worksheet XII

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1002	This problem introduces the problem-solving strategy of "making a list." In the problem-solving session, have students do the same problem, with different digits. ANSWER: 9
2	1001	The two parts of this problem, when taken together, lay the foundation for a multi-step word problem. ANSWER: $7 and $2
3	1125	Measuring length is the essence of this problem. If students are having trouble, it's possibly because they don't know to place the end of the ruler--or the "zero" mark--next to one end of the pencil. It might also be that they're trying to use a ruler that's too complicated for them--i.e., one that has too many divisions, other than centimeters--indicated on the ruler. ANSWER: (C) 10 cm
4	1050 1005 1004	This puzzle requires some computational ingenuity for a 1st grade student. Most of the students who solve it will start on the top line, where they already know 2 of the 3 numbers whose sum is 11; they will get the 3rd number either by subtraction (working backwards) or by guess-check-revise. Once they know this number, they can then get the botton, middle number in similar fashion, and they're then on their way! In the small-group session, give them this problem to show the technique:

6		2	= 16
	4		= 16
		5	= 16
16	16	16	

ANSWER: Add →

↓

5	5	1	= 11
2	3	6	= 11
4	3	4	= 11
= 11	= 11	= 11	

5	1072	Numeration--is being reinforced in this problem. The difficult part for students is that the groups of ten are not already ordered to the left of the ones. This is different from the typical textbook situation. Have similar problems to these in your small group session, but with real manipulatives. ANSWERS: 43 and 58
6	1107	Fundamental geometric figures--in this case, angles--are being reinforced in this problem. In the small-group session, use figures other than a hexagon to show this concept. ANSWER: 6
7	1125	This problem is similar to problem 3 above, in that it has the student deal with measuring length. ANSWER: Make or mark off a 10-cm length, to use in checking the answer.
8	1153 1157	The student is to collect and record data related to a probability experiment in this problem. In the small-group session, go over the experiment twice as a group, actually flipping a coin and recording the data, and making the concluding statement. Stress that they'll probably all get different answers on their own, just as you get doing it twice in a group. ANSWER: The answer should match the data the child collects.

Grade 1, Worksheet XIII

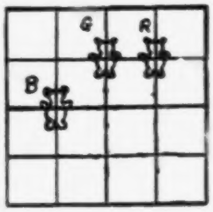
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	--	This is a simple counting problem, and hence not directly related to one of the skills of excellence. However, in discussing the results with children, lay an intuitive foundation for multiplication of whole numbers by saying: "Look, there are 5 groups, with 4 in each group. How many will that be altogether?" "There are also 4 groups when you look at it another way, with 5 in each group." ANSWER: 20 (pennies)
2	--	Students can solve a similar problem to this one by taking 20 pennies, and saying "1 for you, 1 for me, etc." in the small-group session. ANSWER: 10
3	1003	This problem lays the foundation for division of whole numbers--for a child to solve it, they could make use of skill 1003 (drawing a diagram). They might circle groups of 7 pennies till they don't have enough left to buy another pencil. Or they might actually take 20 pennies and remove them 7 at a time, replacing them with a pencil, as far as they can. ANSWER: 2
4	1001	This problem must follow the one above it in sequence, for the child to be successful. For any that are, the foundation is being laid for multi-step word problems. If they drew a diagram as described above for #3, they could merely count the pennies not circled, to find this answer. Note: You might mention addition and subtraction here, for those who know it, but don't emphasize these operations as much as the counting method. ANSWER: 6

5	1020	This problem involves the sort of real-world situation the child would meet every day, and hence reinforces managing personal income. ANSWER: wagon and frisbee
6	--	This problem is straight computation, and does not directly support one of the skills under the standards of excellence. ANSWER: See child's worksheet

Grade 1 , Worksheet XIV

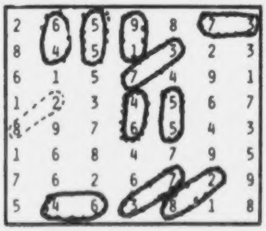
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1146	For students having trouble with this cartesian coordinate problem, have them make some pretend trips with their fingers. The first number always tells how far to the right (or East, in this problem) to go; the second number tells how far up to go (or, to the North). ANSWER:  B = Blue G = Green R = Red
2	1124	This problem involves simply reading a thermometer, and the readings are both positive numbers and do not require interpreting "between visible numbers." Because of future problems, however, take the opportunity (in your small-group session) to expand the problem to readings like 25°, 45°, etc., and even -10°. ANSWER: 10°C, 50°C
3	--	This problems lays an intuitive foundation for the concept of division. Students can solve similar ones, in the small-group session, by representing the fish with pencils, and the fish bowls with glasses, and physically moving objects. ANSWER: 4
4	1145	Students are asked to interpret information from a bar graph in this exercise. In your small-group session, you could have a similar graph made for your particular class, and discuss these same sorts of questions. ANSWER: 5, 3, 4

Grade 1, Worksheet XV

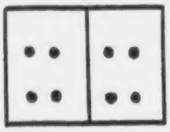
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	--	"Rounding off" is a skill that is being introduced in this problem, in the form of "closer to." ANSWER: Shoes
2	--	There are a large number of correct answers to this problem. In the small-group session, you might offer an extra star to the one who finds the most number of sums to ten. (If you do so, limit the children to using number pairs that are adjacent). ANSWERS:



These are just a few of the combinations totaling ten.

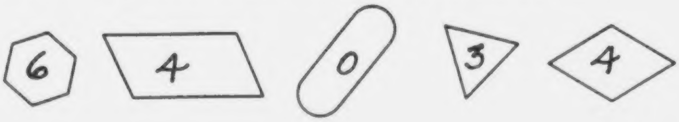
Problem	Skill of Excellence	Comment
3	1074 1004 1005	Solving an algebraic equation is being intuitively introduced in this problem. Students might solve it by "guess-check-revise," or by "working backward" if they know to subtract 8 from 12. ANSWER: 4
4	1007	Numeric and geometric patterning are being reinforced in this problem. Most students will see the pattern as 2,2,3,3,__,__,5,5,6,6, but a few might see it as 4,__,10,12. ANSWER:



5 1110 "Vertex" (pl: vertices) is a topological term being introduced intuitively at this time. You might extend the meaning, and make a distinction between "vertex" and "angle," in the small-group session by looking at networks like and counting the vertices.

(All corners are considered vertices of a network, but there are some vertices that are not located at corners.)

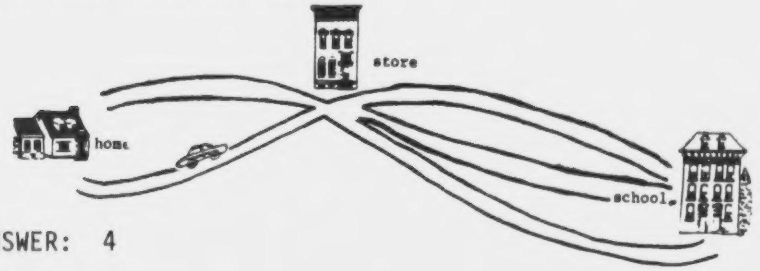
ANSWER:



6 -- Students can go through problems similar to this one in the small-group session, as an introduction to addition of 2-digit numerals without regrouping.

ANSWER: 59

7 -- Students might solve this by drawing the paths they could take. In the small-group session, extend the idea to a situation like:



ANSWER: 4

Grade 1, Worksheet XVI

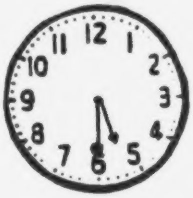
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1001	The foundation is being laid in this problem for a two-step word problem. The student should think of putting together the ducks and bunnies, and then removing 1 animal. In the small-group session, go over this process with different objects and different numbers, acting out the physical movement. ANSWER: 4
2	1004 1005	This problem is set-up to encourage "working backwards" mentally. The students can figure "to wind up with 2 after subtracting 7 I had to have 9 as an intermediate step. So I needed to have 9, after I added 6. So I needed to start with 3." A student might also find the answer by simply guessing the missing number, and checking to see if they get 2 as the answer. If not, they revise the guess; this process is continued till they are successful. Go over similar, but not exactly the same, problems in the small-group session. ANSWER: 3
3	1017	Have students practice counting various coin collections like this one. They should start with the largest coin value (25¢ in this case) and add on the next lowest value, etc... Here they would count: 25¢, 35¢, 40¢, 45¢. Note that students do not have to add to find the answer, although this is acceptable. ANSWER: 45¢
4	1051	The student is being introduced to the concept of a fraction being larger than another fraction, in this problem. ANSWER: B

5	--	Students will usually solve this problem by counting (possibly on their fingers) rather than by adding 7+7. If they have trouble, they can use a calendar and touch the days with their fingers. ANSWER: 14
6	1007	A number pattern is involved in this problem - counting by 5's starting with 3. Have students experiment with this sort of patterning in the small-group session, starting with various numbers (other than 3), and counting with numbers other than 5. Have them use a number line to make jumps of a certain size. ANSWERS: 13, 23
7	--	This problem is a simple, one-step word problem. The addition involves three 2-digit numbers, without regrouping. ANSWER: 39¢
8	1003	Students have seen a similar problem to this one, on worksheet XV. They will likely solve it by drawing the paths, and counting them. ANSWER: 6

Grade 1 , Worksheet XVII

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1006	Students must discriminate visually between the same basic symbol, placed in 3 positions. For students having trouble, have them work on similar puzzles using letters of the alphabet. ANSWER: IT
2	1018	You might discuss with students what our tax money pays for (schools, hospitals, etc.), to help them internalize what the problem is about. You also might have several objects at the small-group session, with appropriate price tags, and have the students find the total cost. ANSWERS: 53¢, 11¢, 2¢, 6¢, 27¢
3	1032	Students are introduced to the concept that underlies "rounding off" in this problem. In the small-group session, have a larger number, and have them actually compare distances for other numbers, to determine closer than. ANSWER: 30, 50, 40, 40
4	1123	The student meets "elapsed time" in this problem. Have them practice such situations in the small-group session, with a clock with moveable hands. ANSWER: 

5 1048 The student is asked to use an alternative method to compute these sums (other than paper-and-pencil). Have them practice such problems together in the small-group session, and perhaps give them a teacher-made practice sheet for overnight drill.

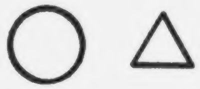
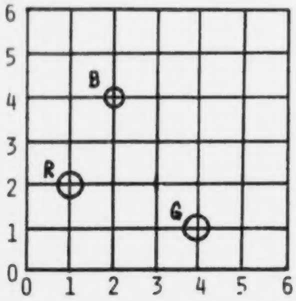
When they turn in their paper, give them this problem which is taped to the table or desk and watch to be sure they don't count on their fingers, or on the desk top, or whatever. They get credit only for doing it mentally.

$$\text{Problem:}\quad \begin{array}{r} 8 \\ 6 \\ 7 \\ 4 \\ \underline{+2} \end{array}$$

ANSWER: 27

Grade 1, Worksheet XVIII

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1001	Repeated addition, or skip counting, is used to find the answer to this story problem. The foundation is being laid for a multi-step word problem. In the small-group session, go over similar problems with dogs and milk-bones, or monkeys and bananas, etc. ANSWER: 20
2	1007	Continuing a geometric pattern is the essence of this problem. The student will probably have to use the information to the right of the first blank, to find the figure there. ANSWERS: 
3	1146	Students are asked to find points on the cartesian coordinate system in this problem. This is the first place in which the points are written as ordered pairs inside parentheses, instead of as "East so far, North so far." You might want to return to some previous worksheets (VI, XIV) for familiar problems, so that students can be introduced to the new notation in the small-group session. ANSWER:  B = Blue R = Red G = Green
4	1004	Students will probably solve this by "guess-check-revise." Since the problem doesn't say that all the arrows hit the target, a number of solutions are possible. ANSWER: A number of answers are possible, such as 4,4,4,3,1 and 5,5,4,2.

5 1127 The student is determining the volume of the solid figure; you might intuitively introduce this terminology in the small-group session. Some students will not be able to visualize the entire set of cubes needed since some aren't visible--such students need to take other 2-dimensional drawings similar to this one, and try to get the answer, and then actually build the figure to see if they are correct.

ANSWER: 8

6 1004 Students will also solve this via "guess-check-revise."

ANSWER: 8 2
3 7 (any order)
4 6

7 -- This is a simple, comparison-of-sets interpretation of subtraction.

ANSWER: 3

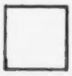
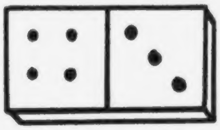
8 1035 Students are to answer these 3 problems based on their own knowledge about the cost of common items. They should reason along the line of "I know a new dress won't cost as little as 24¢, but it might cost $24, so $ is the correct symbol to use." Go over similar problems in the small-group session, using objects familiar to the students (bikes, candy bars, etc.).

Note also that students might put "$" to the right of the numeral, as they would "¢," and to go along with the way it's read. This is a common mistake, based on a logical choice by the child.

ANSWER: (A) $
(B) ¢
(C) ¢

Grade 1 , Worksheet XIX

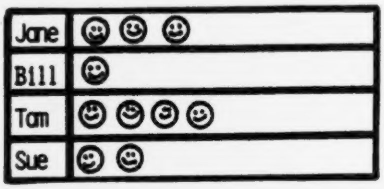
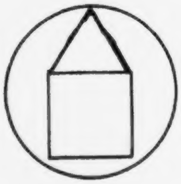
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1007	Geometric patterning is presented in this problem. ANSWER: 
2	1050	Listing all the sums of 5, including those with "commuted addends," makes this a computational puzzle. In the small-group session, list all the families for several numbers other than 4 and 5. You might even ask for them to notice a pattern to the number of family members (one more than the number itself). ANSWER: 3+2, 2+3, 4+1, 1+4, 0+5, 5+0 (in any order)
3	1125	Students are asked to measure the length of a pencil, using a non-standard unit. Do similar problems using other non-standard units in the small-group session, ensuring that students always start at one end of the object being measured, and get the closest possible whole number of unit lengths. ANSWER: 5
4	1007	This problem involves a numerical pattern. ANSWER: 
5	1007	Numerical patterning is also in this problem, but in a more difficult form since the numbers "bridge a decade." ANSWER: 30, 29, 28, 27
6	1170	Practice in reading a digital display is provided in this problem. ANSWER: 134

7	1144	Students are asked to read and interpret a pictograph in this problem. In the small-group session, get more mileage from the problem by asking other questions, such as: Who ate the least? How many more did the squirrel eat than the monkey? If Suzie fed those 3 animals from a bag of 20 peanuts, how many would she have left? ANSWER: Squirrel
8	1036	This problem provides practice in estimating measurement. The student needs to estimate the area of this sheet of paper using a non-standard element. You may let the students trace the card to help them get the idea of area and measuring, or take out an actual deck of cards and lay them down on the paper to get the concept of "covering." ANSWER: 8, 9, or 10 cards would be acceptable.

Grade 1 , Worksheet XX

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1147	Students make a pictograph using "smiling faces." In the small-group session, you might have them make another type of pictograph, given similar directions. You might also extend the lesson by asking questions (after a pictograph is made) like "who has the most?," "How many more ......," etc. ANSWER: 
2	1110	"Traceability" of networks is introduced in this problem from topology. The network on the left is "traceable" if you start where the "roof" meets the "wall." The other network is not traceable. In the small-group session, have students consider similar (simple) networks, trying simply by tracing to see if they are traceable or not. Later they'll learn another method. ANSWER: a. 
3	1126	The concept of area is reinforced in this problem. This is the first place students will use a standard unit (square centimeter) to find the area. In the small-group session, have students find the area of similar shapes, and report the area in square centimeters. ANSWER: 8 (centimeters)

4	1153	In the small-group session, have students do this experiment as a group, recording the information on the chalkboard. This problem lays the foundation for an important probability skill--collecting and recording data--so be sure the students roll the die "fairly," and discuss what would happen over time if a large sample of data were collected. ANSWER: Count to be sure there are 20 tally marks altogether.
5	1110	Another topological concept--vertices, edges, and faces of a polyhedron--is introduced intuitively at this time. In the small-group session, go over the counting process with other familiar polyhedra--a pyramid, a cardboard box, etc. The important point is to distinguish between these 3 attributes of polyhedra. ANSWER: 6, 12, 8
6	1149	This verbal problem has the student make a prediction from given data, assuming that the trend continues. Correct answers would be any numbers larger tha 3, but most students will "complete the pattern" and put in 4 and 5, respectively, as answers. ANSWERS: Look for 4 and 5, but give credit for any reasonable numbers larger than 3.
7	1003	An important part of this problem is for the student to draw a sketch to match the verbal situation. The drawing should show 3 students, with 6 new shoes, and one having a belt--stick figures or other brief sketches are preferred, but the correct number of people, shoes, and belts is necessary. The students can then count and find the answer. ANSWER: 7 (Note: An answer of 4 should also be accepted--the student was likely counting a pair of shoes as "one thing." Give them credit!)

8 -- Some students will find the answer to this problem by counting, but they'll have to count things that aren't visible. Or they might reason along the lines of "four tires on each car, and 4+4=8, so he will need eight tires."

In the small-group session, give similar problems using bikes, big wheels, skates, etc.

ANSWER: 8 (or 10, counting the spares)

Grade 1 , Worksheet XXI

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1006	Students will probably have a hard time deciding visually which of the 2 larger figures do not fit in the box. They can decide by tracing each one, and manipulating the tracing overlaid on the box. ANSWER: The figure closest to the box will not fit.
2	1017	This problem simply provides practice in writing a coin collection using "dollars and cents" notation. Similar problems can be considered in the small-group session. ANSWER: $1.15
3	1046	There are two aspects to this problem that will likely give students trouble. First, they are used to "doing something" with problems like "9+6" and "20-5," and not comparing them as expressions. The equal sign, in particular, is frequently interpreted as an action-item because that's what children do when their only exposure is in exercises like "7 + 4 = ." Secondly, the symbols > and < are difficult for students to learn and distinguish. A hint like "It's the same symbol, but can be turned always so the large opening is next to the larger number" might help. Practice with similar problems in the small-group session should benefit the students measurably. ANSWER: =
4	1035	The purpose of this problem is to help distinguish which students have developed an awareness of the cost of familiar items. The only part students might confuse is "a computer" with a calculator. In the small-group session, be sure the students understand the difference. ANSWERS: A toy car. A coloring book. A small teddy bear.

5	1006 1107	Students should be encouraged to look for triangles other than the most obvious. In the small-group session, go over similar problems, using overlapping rectangles and squares. ANSWER: 3
6	1073	In the small-group session, have some pennies and have each child actually divide up a group, saying "one for you, and one for me, etc." Then they label their collection as "even" or "odd." ANSWERS: even odd odd even
7	1036	Students should use the 8-foot length of the car (bumper to bumper) in arriving at a reasonable answer as to its height. The height is either about the same as the length, or obviously greater or less than the length. In the small-group session, take some common objects and do similar problems. ANSWER: B

Grade 1, Worksheet XXII

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1003	There are two different problems in this exercise: the first one involves the union of two sets (boys and girls--9 + 6 = ?) and the second is "comparison of sets"--(9 - 6 =?). The second part of the problem is more difficult than the first part, because "comparison of sets" is frequently not covered in elementary textbooks until a child sees them in a word problem, such as this one. If children are having trouble with this problem, have them draw a diagram, as shown to the right, and do a "one-to-one" matching of boys and girls, counting the "extra boys." B-------G B B-------G B-------G B B-------G B B-------G B-------G ANSWERS: 15, 3
2	1006	This problem is ususally solved via counting, but it does involve visual discrimination to some degree. The fourth question intuitively uses "more than," a sub-skill for skills that involve > and <. ANSWERS: 10, 4, 6, girls, 5, 5, girls
3	1168	Use of a calculator is the skill reinforced in this problem. ANSWER: 15
4	1072	Numeration skills are reinforced in this problem. The unusual part of the situation is that the tens and ones are not "lined up" from left-to-right as in most textbook situations. The student has to re-order the values shown, before writing the number. In your small-group session, give similar problems, but with real manipulative objects. ANSWER: 86; 34; 75

5	1030	"Estimating costs" is covered in this problem. "Less than" is also introduced, with money. ANSWERS: The watch has a red ring around it. Everything else, except the turtle, has a blue ring.

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1007	This problem involves a numeric pattern--counting by tens, but starting at a starting point other than zero. In the small-group session, have students practice counting forward (and perhaps even backward) orally, in similar problems. ANSWER: 16, 26, 36, 46, 56, 66, 76, 86
2	1005 1050	This is a puzzle that requires the student to demonstrate understanding of, and ingenuity with, computational principles. The student must work backwards to determine some answers. ANSWERS: 10 3 = 7 6 2 = 4 = = = 4 1 = 3
3	1107	This problem is simple recognition of triangular shapes. ANSWER: Hat, nose, arms and legs
4	1019	This problem requires the child to determine the change he will receive from an amount of money after making a purchase. You might suggest that the child try to use the "count-back" method of determining change, in a small-group session, with similar problems. ANSWERS: 2¢ 5¢ 10¢
5	1167	Have students do a problem similar to this one in the small-group session, but with a different code. ANSWER: 24 in last square.

Grade 1 , Worksheet XXIV

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1002	This problem is similar to problems presented on worksheets II and III, but here the student is not given the chart to fill in. In the small-group session, help start such a chart for those who need a refresher. ANSWER: 6
2	1073	Students have a problem similar to a previous problem on worksheet XXI. Perhaps those who had trouble with it before will have internalized now the difference between "even" and "odd." ANSWERS: odd odd even
3	1074	Have a number of similar problems on the board, with square pieces of paper taped over the number students are to find. After they try, they can check by removing the paper. For those having trouble, have them make up some subtraction problems in horizontal form like this, cover the second number with paper, and give it to another student to solve. ANSWER: 7
4	1145 1149	The student is to interpret the information on the graph to the effect that the puppy's weight is increasing about 5 kg./month. Then the student predicts that the weight in May will be about 25 kg., and completes the bar graph. You may wish to discuss the kind of puppies which would have this increase in weight. ANSWER: The bar over May should go up to about 25 on the vertical axis.

5 1169 1170

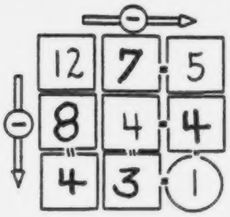
The student should reason that the answer is acceptable, since 5 + 7 = 12. Some students might think the answer is wrong since they don't see 12.00 on the display. In the small-group session, show with several calculators how the display usually doesn't show zeros to the right of the decimal point, unless there are also non-zero digits there too.

ANSWER: C

6 1005 1050

This problem is similar to a previous problem on worksheet XIII. Students who were unsuccessful therefore have another chance to succeed.

ANSWER:



Grade 1 , Worksheet XXV

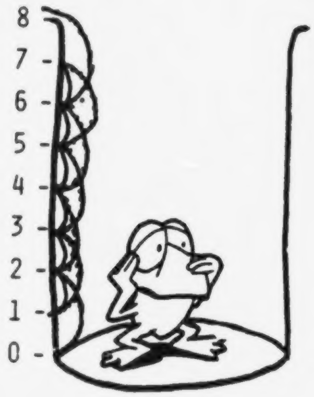
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1001	In your small-group session, simply ask the children if they forgot to count the "mama" dog and cat. ANSWER: 7
2	1146	In your small-group session, have a couple of additional pictures cut out and place them on the grid so students can find their locations. Tell them that they should always tell how far right to go first, since people have agreed down through the ages to do that. For those having trouble, have them "walk" with their fingers. ANSWER: Baseball 1,3 Raccoon 4,3 Fish 2,1 Truck 4,1
3	--	This problem is laying an intuitive foundation for the notion of probability. You should actually bring in a sack of lollipops (or balloons) and go through the experiment. (Be sure the objects that go in the sack are identical, except for color.) If you introduce numbers into the problem, have them read 9/14 as "nine out of fourteen" instead of as "nine fourteenths." ANSWER: Cherry

4 1003 Have students begin their drawing in your small-group session, on a piece of scratch paper. They can re-do the drawing at home, on the worksheet, to gain the answer and their stars. Hopefully the student's diagram will look something like:

Notice that it takes only 7 days for the frog to get out--it doesn't slide back, once it gets to the top on the 7th day.

ANSWER: 7 days



5 1144 In class, ask similar questions to those on the worksheet. (Since students can't yet multiply, they can determine the number of games won by each team via "counting by two's.")

ANSWERS: 2
4
2

TEACHER COMMENTARY

FOR

GRADE 2 WORKSHEETS

Grade 2, Worksheet I

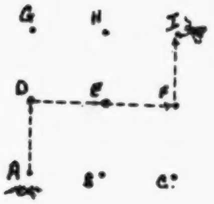
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1073	Several times in the Grade 1 worksheets, students considered "odd vs. even" by deciding if they could divide a collection exactly with a friend, with none left over. You might remind them of this method in your small-group session. Take an even number of pennies and go through the stacking method, and then an odd number. ANSWER: 14 even 15 odd 16 even 17 odd 22 even 25 odd
2	1006	You might suggest that turning a picture will sometimes reveal hidden figures. ANSWER: The lady's face is under the man's outstretched (right) arm.
3	1001 1003	Some students might need to draw a sketch of the 4 animals, and count to find the answer. (In your small-group session, suggest this is always a good way to start a problem you don't understand.) Others might try to count the legs on the pictured frog twice, and insect twice - if so, they might have trouble with the hidden legs on the insect. Still others will add 6 + 6 = 12, and 4 + 4 = 8, and 12 + 8 = 20, to get the answer. ANSWER: 20
4	1168	In your small-group session, have the students just add 1 + 2 + 3 + 4 + 5 on their calculators, and then finish the problem at home. ANSWER: 55

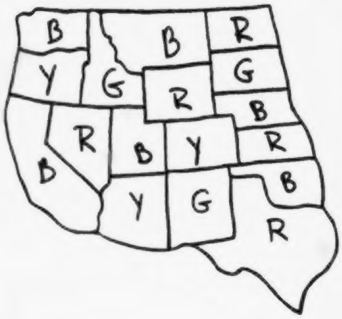
5	1149 1145	In your small-group session, discuss what the graph means, and ask leading questions to be sure they are interpreting it correctly (e.g.-how much did Janet weigh in January?). Watch for students who aren't familiar with abbreviations of the months, or who have trouble "lining up the top of a bar" with the weight it represents. Then have the group discuss how the graph goes up by 1 pound each month, and have them draw in the bar for June, finishing July and August at home. ANSWER: The bars for June, July, and August should go to 45, 46, and 47, respectively.

Grade 2 , Worksheet II

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1002 1003	Students will likely solve this problem by drawing a diagram, sketching all of the possible paths that would work. In your small-group session, you might suggest that they use alphabetical letters at the points, and then "make a list" of the possible paths. You can go over a similar, but simpler, problem in your session by taking 6 dots instead of the 9 shown. ANSWER: 6 paths  Paths: ABCFI ABEFI ABEHI ADGHI ADEHI ADEFI
2	1168	The purpose of this problem is to give students experience using a calculator for computational problems that would be difficult for them otherwise. These are addition and subtraction problems, so the concepts should be familiar to second graders. But the exercises involve several digits, and "carrying" and "borrowing." The last problem might give children trouble since the addition key has to be pressed twice, but only one such sign is shown for the problem. In your small-group session, go over at least one exercise similar to this last one. ANSWERS: 559, 850, 1272
3	1110	This problem is from a new, emerging area of geometry called "topology." Your students might be interested in knowing that the fact that any map can be colored in 4 or fewer colors was once one of the 50 famous unsolved problems of mathematics--it was finally verified in 1976 by a computer program that ran for over an hour! One solution is shown below--each solution will be different, though, so you can show a solution in the small-group session without worrying about giving the children too much assistance. (Note: this problem can also be solved by coloring around the outside of the map, but most children will not think of trying this.)

ANSWER: To check this on a child's paper, first glance to see if more than 4 colors were used. If not, then proceed to look over the map, starting with the smallest states where it's more difficult, and moving toward the west and south.



4 1020

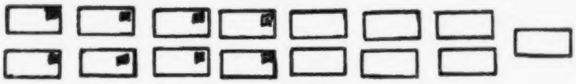
Students are given a realistic situation for this problem setting. In your small-group session, take a similar but simpler problem--make one up using the toys shown, but with smaller prices attached, and have Maria get a dime from the fairy. Have the students solve the simpler problem in class, and tell them that the concept is the same if they want to solve the given problem at home.

ANSWER: Fish

5 1003

Students are asked to draw a diagram to represent this "comparison of sets" subtraction situation. The 15 envelopes they draw should have stamps in the upper right hand corner of 8 of them--give credit if the stamps are anywhere on the envelope, however.

ANSWER:



6 1003

The student is to use the diagram above to solve the given problem.

ANSWER: 7

7 --

This appears to be a simple problem, but it does give insight into how organized a student's approach to such a task might be. Some will simply "mark out" the dots as they count--others will try to group the dots in some way, count each group, and add the resulting numbers together for the total.

ANSWER: 124 dots

Grade 2 , Worksheet III

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1050 1004 1003	This is a computational puzzle that requires ingenuity to solve. Students will probably solve it by logical deduction, combined either with "guess-check-revise" or "working backwards," to get the individual digits. ANSWER: 3,5
2,3,4	1144 1154	These problems all involve getting information from a pictograph. Problem 2 is simply reading the pictograph correctly, but Problem 3 involves the concept of "comparison of sets," a fundamental interpretation of subtraction (although students will probably solve it without subtraction). Problem 4 introduces the underlying concept of the average, although this terminology is not used. Many students will solve this simply by visualizing the softballs being "moved around" on the chart--you might show this to children who have trouble seeing it, on a similar problem. ANSWER: 4, Pirates, 3
5	1001	Division, with a remainder, is introduced in this word problem. The student will probably solve it by counting 9's, till he or she gets to 25. They will then be on their 3rd group of markers. Go over a similar problem in the small-group session. ANSWER: 3
6	1006 1128	Students should apply visual skills in seeing that the scale is balanced, which means the total weight on the 2 ends is the same. Then they should know intuitively that, if 3 circles weigh the same as 2 squares, then a ■ has to be heavier than a ● . If they have trouble with this, relate the situation to a "see-saw" with three 1st graders balancing two 3rd graders. ANSWER: ■

7	1018	Students have to add the amounts given, to find the total sale price, and then find the amount of tax from the chart. Notice that they are not asked to add the two together. This problem concentrates on the tax itself. To emphasize this, you might discuss briefly with the students what sorts of things our tax money does for us (building roads, schools, etc.). ANSWER: $.04 should be circled
8	1002	Hopefully students will solve this problem by "making a list." The other numbers are: 91, 82, 28, 73, 37, 46, 64, and 55. ANSWER: 8
9	1001 1009	This problem involves extraneous information and will later be solved by several computational steps--multiplication and division. At this point, since students have not yet met multiplication or division, they can solve it either concretely or by drawing pictures of the candy, and dividing it up in the manner "one piece for me, one for you, etc..." ANSWER: 12
10	1007	This problem involves a visual pattern, moving from left-to-right. ANSWER: A square that's divided into 16 smaller squares.

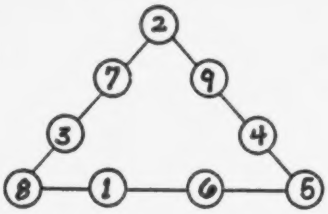
Grade 2, Worksheet IV

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1001	This problem lays the foundation for a multi-step word problem, in that students find the answer to two "sub-problems," and then combine these answers to answer the third part. One difficulty might be in counting the legs of the animals, if the legs aren't visible. Another interesting point will come up in that some children will say that chickens have ears, and some will that chickens don't have ears. (It all depends on the way you define "ears"--chickens don't have external ears, but they do have internal ears, else they couldn't hear themselves.) So the answers to the last two parts will vary, depending on the child's viewpoint. ANSWERS: 18 legs 8 (or 10) ears 10 (or 8) more legs than ears
2	1030	The student should be encouraged to think of 55¢ as "a little more than 50¢." Since five 50¢ pieces would be $2.50, five times 55¢ would be a little more than $2.50. Therefore, five school lunches would be closer to $3 than to any other choice. ANSWER: $3
3	1002	The student should solve this problem by "making a list." They then count to find the answer to the problem. (Last year they had similar problems, but without street names, so they probably solved them by tracing all the paths.) Go over a similar problem in the small-group session. ANSWER: 6 ways (Monroe, Green) (Monroe, Milton) (Monroe, High) (Adams, Green) (Adams, Milton) (Adams, High)

4 1050 1004 This is a computational puzzle that requires some ingenuity. Most students will initially start it by "guess-check-revise," and gradually refine their guesses. Several answers are possible, so look for commonalities among the students that are successful in the small-group session (sum of the corner points, e.g.).

ANSWER: (one answer)



5 1006 1107 This problem reinforces the term "triangle" and it also involves visual discrimination. Students can be encouraged to solve such problems in the following manner:

Look for the smallest triangles and count them first.
Find the next largest triangle, and see how many of them you can find.
Go to the next largest, and do the same.
Continue this until you've gotten to the largest you can find.

In this case, there are 9 small triangles like: ▲
There are 3 of the next largest, like: ▲
Finally, there is 1 of the largest possible size, like: ▲

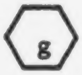
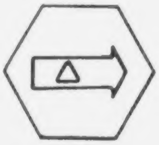
ANSWER: 13

6 1022 This problem reinforces the skill of reading a time schedule, in a real world situation.

ANSWER: Tuesday and Thursday for PE
3 hours doing math
Thursday from 1:00 till 2:00 (movie)

Grade 2 , Worksheet V

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1007	This problem is a sequential geometric pattern. The student should notice that each shape gives two large figures and a small one--and two capital letters and a small letter. ANSWER:  (the first shape on the left)
2	1001 1019	This is a multi-step word problem that involves getting change after a purchase. The student will probably add 19¢ and 20¢, and subtract that total from 49¢ to get the change. Note that a real concrete way to solve the problem would be to mark out a dime, nickel, and four pennies for the cupcake, and two more dimes for the ice cream. Then look at what's left in the pile. ANSWER: 10¢
3	1004 1002	Students might solve this by "guess-check-revise" by guessing pairs of numbers with sum 28, and checking to see if the difference is 6, and revising the guess each time. Or the student might be encouraged to actually make a list of the numbers that sum to 28--0 & 28; 1 & 27; 2 & 26; etc.--till they find a pair that has a difference of 16. Go over similar problems in the small-group session. ANSWER: 17, 11 (in either order)
4	1007	This problem offers another experience in solving a geometric patterning problem. The student would notice that the outside figure "adds a side" each time, the inner arrow rotates counterclockwise, and the small, central figure "subtracts a side" each time. ANSWER: 

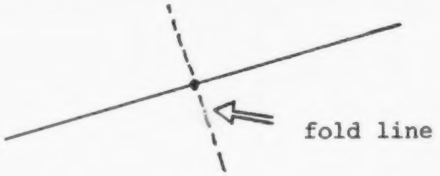
5 1156 Students will be exposed to an underlying theme of probability in this experience with the pigs, that of the ratio of a subset, to the set itself.

ANSWER: 2 out of 5 have spots
3 out of 5 have curly tails

6 1111 Students have a chance to consider intuitively the concept of constructing a perpendicular to a line, at a given point on the line, in this problem. Students must understand that, in folding the sheet of paper, they have to be sure that one side of the line segment "falls on top of" the other side of the line segment.

In your small-group session, have them do this process using other lines made on other sheets of paper. You might intuitively introduce "perpendicular lines" at this time.

ANSWER:



7 1048 Students have a chance to show that they can subtract mentally in this problem. In teaching them how to do this, notice that the problems selected for practice are ones where the minuend is very close to a number that is easy to subtract--students should be encouraged to "adjust" the given problem by adding the same number to the top that they add to the bottom to get this easy number, and then subtract mentally. In your small-group session, go over similar problems for practice. When they turn in their paper, give them this problem, and check to be sure that they do it mentally:

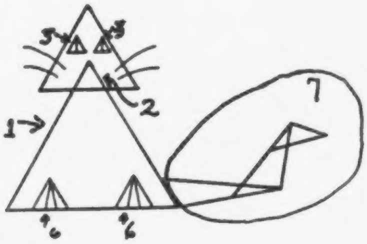
$$\begin{array}{r}345\\ \underline{-199}\end{array}$$

Note: At a later time (a few weeks) you might review this briefly, and eventually show them how to do a similar thing with addition. However, with addition, they'll have to adjust the two addends in opposite directions to compensate. So be careful when you do this--students who are successful with it will have developed a real "feel for numbers."

ANSWER: 146

Grade 2 , Worksheet VI

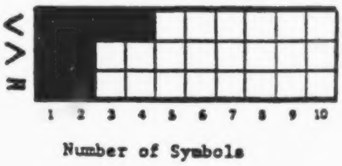
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1164	The Cartesian Coordinate system is introduced in this problem setting. It's important for the students to realize that you go to the right first, and then up, to locate points. This is simply convention. For students having trouble, have them trace the path with their finger. Have them locate points other than the boat, church, pool, and bridge, in the small-group session. ANSWER: 5, 2 (The church can be distinguished because of the cross on the top.) 2, 1 3, 4
2	1109 1006	The student has to know what "triangle" means in this setting, and also know that there are "overlapping" triangles in the drawing. The problem therefore reinforces visual discrimination also. ANSWER: 28 
3	1004 1005	This problem might be solved by "guess-check-revise." If so, the student will simply guess digits for each box, till they get ones that "work." Or, the student might "work backwards" by turning the subtraction situation into an addition one. If so, they'll search for the missing digits in this fashion: box + 2 = 5, 4 + 2 = box, etc. In the small-group session, have students make up a similar subtraction problem and cover some of the digits with squares of paper, and give the problem to another student to solve. ANSWER: $\begin{array}{r} 365 \\ \underline{-43} \\ 322 \end{array}$

4	1167	This problem allows students to show that they can follow a mathematical flowchart that has a branch in it. The difficult part will be for students to realize that they must take different paths at the decision, depending on the answer to the decision. In a small-group session, have students take numbers other than 8 and 15, and trace their paths. ANSWER: 11 when input number is 8 [bottom box] 12 when input number is 15 [top box]
5	--	The student locates January 21st, and sees that it's a Monday. He or she then moves backward a space to the Sunday column, and counts backward three Sundays in that month. This problem can be thought of as laying the foundation for "working backwards" mentally. ANSWER: 3
6	1125	The purpose of this problem is to have students measure the length of something that's not in a straight line. They can take a real piece of string and lay it down to match, and then measure the string, or do something similar to this. In the small-group session, just asking how they have already done it will help students who have no idea how to begin. ANSWER: Accept an answer between 27 and 29 cm

Grade 2 , Worksheet VII

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1017 1046	This problem involves both recognizing the value of collections of coins and bills and the concepts of greater than and less than for real world situations. Students who are having trouble with this problem might take out real coins, and try to match the coin to the picture first. If they can do this correctly, it's just a matter of counting. Note that the bank with the most coins, is actually worth less than the other two. ANSWER: The bank in the right should be circled. The center bank should be "X'd."
2	1017	Students will probably solve this by finding the value in each bank--$1.15, $1.07, and $1.35--and adding. Some might solve it by counting the coin values of all 3 put together. Students who got an incorrect answer through counting should be encouraged to work from the biggest coin values to the smallest--for those who got the wrong answer through adding, watch for misplaced decimal points as the problem. ANSWER: $3.57
3	1009	Since the number of cookies that MOM had to start with is not involved in solving this problem, the problem involves "extraneous information." ANSWER: 19 (2 + 6 + 5 + 6 = 19)
4	1046 1145	This problem has the student consider the concepts and symbolism for greater than, less than, and equal to in expressions involving whole numbers. But the problem also extends to making a bar graph. If students miss the problem, check to be sure they have: 4 <'s 2 >'s 2 ='s In the small-group session, go over a similar set of problems written on the board, and quickly make the graph. ANSWER: 

5 1031 This problem gives students the chance to demonstrate that they have developed a "feel for numbers" in estimating. "10 inches" can't be correct, since the pencil is shorter than the width of the paper. Of the remaining choices, the student will probably reason that "4 inches" would be about *half* the width of the paper, and the pencil is clearly *more* than half (for those that have a good concept of "half"). So "4 inches" isn't as good an answer as "7 inches." Go over similar problems in the small-group session, using the length of a sheet of paper as 12 inches, with various objects drawn so they can be easily compared lengthwise.

ANSWER: 7 inches

6 -- While this problem does not directly address one of the skills of excellence, it should be enjoyable for the students. In the small-group session, select one name (perhaps the principal's last name) and find its value.

ANSWERS: lake = 5 + 2 + 5 + 3 = 15
brush = 2 + 7 + 8 + 7 + 4 = 28
father = 3 + 2 + 8 + 4 + 3 + 7 = 27
puppy = 7 + 8 + 7 + 7 + 9 = 38
chain = 2 + 4 + 2 + 4 + 6 = 18

Grade 2, Worksheet VIII

TEACHER COMMENTARY

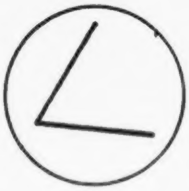
Problem	Skill of Excellence	Comment
1	1006	Students need to begin this search in an organized fashion, perhaps starting with the smallest size triangles and moving up to larger ones. In your small-group session, you might start and do a few "layers" for them. ANSWER: 13
2	1050 1004	A few students will probably realize that you need to take one of the larger numbers, and put it with the smallest numbers to "balance things out." From that point, it's just "guess-check-revise." ANSWER: Move 9 to the first circle.
3	1126	Students once again meet the concept of "area" in this problem. For the first time, however, they'll confront "half-squares." In the small-group session, have some cut-out unit squares and half-squares available, and make several figures and have students find their areas. Do not stress "half" in counting, but rather use figures where the halves always fit together to make another whole unit square. In this manner, you can simply count all the whole squares, and then the half-squares two-at-a-time, to find the total area. (You can avoid having to count by halves.) ANSWER: 12
4	--	In a small-group session, go over similar problems like "with two 6's, make a number bigger than 50." ANSWER: 333
5	1170	Students need to be familiar with the keys on a calculator to solve this problem. They will learn that there are certain mathematical symbols (comma, $, ¢, ⟌) that do not appear on a calculator. ANSWER: d

6	1036	In the small-group session, have some square decimeters cut out and have students measure several flat surfaces that are not an exact number of unit squares. This will force them to estimate the final answer of their area, in square decimeters, using an intuitive notion of rounding off as "closer to." ANSWER: 6
7	1074 1004	Students have the chance to begin dealing with algebraic notions in these problems. They can probably find the answers by "guess-check-revise." The purpose of this problem is not to practice computation, but rather to get at the algebraic equality notion. Students who are weak computationally should therefore be encouraged to check their guesses on a calculator. In a small-group session, have students as a group solve similar problems you provide, with a piece of paper taped over the "missing number." ANSWER: 23, 12, 38

Grade 2 , Worksheet IX

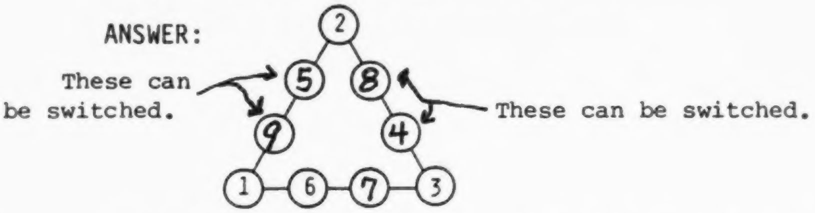
TEACHER COMMENTARY

Problems	Skill of Excellence	Comment
1	1001 1003	This problem involves 2 steps. The student should add the apples on hand (12+8) and subtract that total from 25 needed. Students can solve it by drawing a diagram. ANSWER: 5 apples
2	1003	Students will almost naturally draw a diagram to solve this non-routine problem. In the small-group session, have students determine the total number for stairs 6 cubes high, or 7. ANSWER: 15 cubes
3,4	1022	These two problems have students reading and interpreting information from a chart. In the small-group session, use the same chart, but ask different questions. ANSWERS: 3) Thursday 4) Friday
5	1050	This computational puzzle is not difficult if students follow the steps in the order in which they are presented. Have them follow a similar set of directions for this same chart, in the small-group session. Try: A) Two numbers whose sum is 4 B) Two numbers whose sum is 6 C) Two numbers whose sum is 17 D) Two numbers whose sum is 12 The answer to this similar problem is 6. ANSWER: 7

6	1107	The student is asked to identify an angle. ANSWER: 
7	1126	The student is asked to find the area of a figure, using a non-standard unit. Have them do similar problems in the small-group session. ANSWER: 8
8	1050	The student can solve these computational puzzles, with a little ingenuity. Have several problems like this on large sheets of paper, with the missing digit covered up. As a group, the students can try to guess the missing digits. ANSWERS: $\boxed{2}$; $\boxed{6}$; $\boxed{6}$; $\boxed{1}$; $\boxed{3}$ $\boxed{7}$ $\boxed{5}$

Grade 2 , Worksheet X

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1005 1050 1004	The student will probably approach this computational puzzle by "working backward." They'll get the 7 first, by subtracting 1 + 6 + 3 from 17. Then, they will use "guess-check-revise" to find what the other two sides have to be, to sum to 14 and 9. ANSWER:  2 5 8 These can be switched. 9 4 These can be switched. 1 6 7 3
2	1006 1128	For students having trouble with this problem, have a balance beam set up so they can go through similar experiences. You might also relate the problem to a see-saw on a playground. ANSWER: B
3	1009 1021	The problem involves extraneous information, and elapsed time. Students can solve it by taking a clock with moveable hands, setting it at 7:45, and then moving the hour hand 4 more spaces. Consider similar problems in your small-group session. ANSWER: 11:45 AM
4	1031	Students can estimate the distance for the last two paths, by comparing them visually to the first two paths. ANSWER: B
5	1108	Students are introduced to the term "congruent" in this problem. In your small-group session, present them with several examples of congruent vs. non-congruent shapes. Use the concept "just alike if you turn it" to define the concept intuitively. ANSWER: The two left-most figures are blue.

6 1166 The student is to place the steps in a flowchart in a logical sequence. Have several other such "daily activity" sequences available for consideration.

ANSWER: 4
2
1
3

7 1006 The student should be encouraged to actually check their answer on this famous optical illusion. They can trace one circle and put it over the other one to decide.

ANSWER: They are the same size.

8 1168 This problem gives kids a chance to use their calculators. Be sure to mention that the answer looks like the word "hi," and then mention that other words are frequently spelled out on calculators as "fun things." (Words like shell, Bob, Bells, etc.)

ANSWER: B

Grade 2 , Worksheet XI

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1009 1003	The number of adults is extraneous information in this problem. Students who understand this, but can't decide what arithmetic to do, can draw a diagram to find the answer. ANSWER: 15
2	1018 1009	Extraneous information - the cost of the rope and hat - is included in this word problem. Students also must add the tax to the total. ANSWER: $2.03
3	1035 1037	The student must use his personal knowledge of measurement to give a reasonable response. Computation or estimation will not help the student derive an answer. ANSWER: liters
4	1009	This problem also involves extraneous information - the number of apples in the basket. Many students will assume you need to subtract 4 from 44 to get the answer. ANSWER: 4
5	1078	The student will have to compute the totals on both sides of the box, and then compare them, to decide on an answer. In the small group session, have students put similar problems on 3x5 cards for other students, with the correct answer hidden by tape. ANSWER: >

6	1021	"Elapsed-time" is the essence of this problem situation. Students who have difficulty can consider similar problems on a clock with moveable hands. ANSWER: 4:30
7	1145	"Reading and interpreting a table" is at the heart of this problem. Have students answer similar questions regarding this chart in the small-group session. ANSWERS: Fran, 5, 5
8	1168	Notice that the = has not been shown in this problem, but it's necessary to push this key to finish the problem. Have some similar problems for the small-group sessions, ones whose answers spell common words like oil, shell, Bob, etc. ANSWER: SELL

Grade 2 , Worksheet XII

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1002	This problem reinforces the ability to use a table as an organizer for an appropriate problem situation. The student is to find all the ways to make 15¢, using combinations of pennies, nickels, and dimes. In your small-group session, you might take a similar problem, perhaps for 10¢, and show all the ways. ANSWER: In any order, the student could show: 10 1 0 5 2 0 5 0 1 0 3 0 0 1 1
2	1022	This problem involves reading the information in a chart, and applying it in a real-world situation. It also impinges on the skill of greater than, less than, and equal to. In your small-group session, consider similar questions using the same chart. Allow students to use a calculator if they need to. ANSWER: B.
3	1031 1125	Measuring length is the skill being reinforced in this problem, but it also includes the skill of approximation since none of the lines turn out to be exactly a whole number of centimeters long. Students might have trouble with this if they're not lining up the "0" on the ruler, with the very end of the line segment, or if their ruler has a lot of "distracting" divisions within the major units of measure. ANSWER: 2, 4, 7

4 1050 1004 1005 This problem requires some computational ingenuity, and would probably be solved either by "guess-check-revise" or by "working backward." If it's "guess-check-revise," the student will simply guess numbers for the empty boxes, check and see if they yield the correct sum, and if not, revise the guess. If they use "working backward," they'll notice the sums (14 and 16) in the bottom row, and mentally turn the problems into subtraction problems (14-8=? and 16-9=?).

In a follow up discussion, bring out that the final sum (bottom right-hand corner) gives the same answer adding down the column above it, or by adding across the row. This is interesting to some students, although many won't notice it on their own.

ANSWER:

8	9	17
6	7	13
14	16	30

5 1072 This problem has to do with numeration concepts--the only challenging feature is that the numbers given are not already ordered from left-to-right, according to place value, as they are in most textbook exercises. Hopefully students will get these correct without adding, but just by observation. Go over similar problems in the small-group session, solving them without addition.

ANSWER: 384; 624; 195

6 1109 Right-angles are introduced in this problem, and a practical way to test to see if an angle has 90° is used. Have students do similar problems in your small-group session.

ANSWER: A, C, and D

7 1108 1125 This problem combines the concept of "perimeter" with that of measuring length. Have them find the perimeters of other triangles in your small-group session - watch for "lining up the ruler wrong" type mistakes.

ANSWER: 22 or 23 cm

8 1149 This problem combines an intuitive notion about probability with predicting outcomes, given a trend that continues. If students have trouble understanding what the problem is all about, actually take a thumb tack, and drop it several times, and record the result using the given chart, and the tally system.

ANSWER: 2nd choice listed (more likely down)

Grade 2 , Worksheet XIII

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1145	The first problem in this set is necessary to lay the foundation for problems 2 and 3. The answer to this particular problem will vary, of course, but can be obtained by finding the value of the student's name from the top line of the page, and comparing it to the answer. ANSWER: variable
2	1046	The purpose of this problem is to continue to lay the foundation, in an intuitive sense, for the concept of "greater than," "less than," and "equal to." In discussing it with the students, you might make a list of some of those with names "less than" Bobby in value, another list with names "greater than" in value, and still a third with names "equal" in value to Bobby. Be sure to bring out that the value does not depend necessarily on the number of letters in the name as much as the value of the letters. ANSWER: depends on the child's name
3	1073	The purpose of this problem is to continue to intuitively introduce the concept of odd vs. even numbers. You might ask them a challenge question in the small-group discussion, of the nature "What would the 15th letter be, the 20th , etc." Write the numbers on the board, so they'll get the idea that the odd and even numbers alternate. ANSWER: odd even odd even odd even odd

4 -- The fraction 1/2 is being introduced in a concrete fashion in this exercise. In the follow-up discussion, be sure to emphasize that "one-half" always refers to things that have been divided equally.

ANSWER: A correct answer for this problem is any line that comes close to dividing the cookie into equal pieces.

5 -- This problem introduces the fraction "one-third" in an intuitive fashion. (Some students will miss this problem because they see the word "two" and divide the cookie into 2 pieces, instead of three.)

ANSWER: A correct answer would be any lines that divide the cookie fairly closely into 3 equal pieces.

6 1167
1168 The student is to follow the logic of the flowchart, and also use a calculator to do the computation involved--notice that a calculator would be necessary for most students to do the addition involved here, since the problem involves "carrying." Some students will have trouble because they aren't told to press the "equals key" on the calculator. Going over similar problems in a small-group session should help.

ANSWER: 63

7 1002 Students who have trouble with this problem might need to use a "chart format" to organize their work. You might start them off on the solution in the small-group session, by first listing the days of the week.

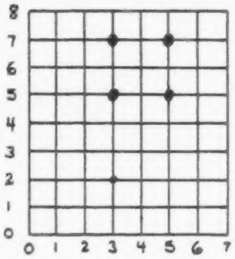
S	M	T	W	Th	F	Sat
					25	

The students would put 25 on a Friday, and then count backwards, (25, 24, 23, 22, 21, 20,...). Stop when you get to 20, and say "Aha, there's a Sunday that's already passed." Let them finish for homework.

ANSWER: 3

Grade 2 , Worksheet XIV

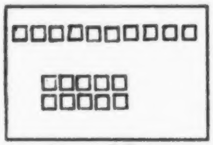
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1155	In a small-group session, have several spinners available of different types, but for which the bases have been divided into equal-sized pieces. Discuss with the group that the chance the spinner will land on a given piece is the number of pieces like that one, compared to the total number on the base. In the case of the spinner in this problem, this chance would be "1 out of 2," or 1/2. ANSWER: 1/2
2	1146	You might need to remind students of what the (x,y) notation means. In a small-group session, have them locate various points on this graph. ANSWER: 
3	--	This problem gives students a chance to extend the problem above, in an interesting way. ANSWER: P
4	1124	There are several aspects to this problem that you might look for as difficulties for students. The numbers go up both sides of the thermometer, in alternating fashion. And in the last problem, the temperature is at an unnumbered increment. In a small-group session, have students make such a problem themselves, and give it to the group to consider. ANSWERS: 40, 70, 55

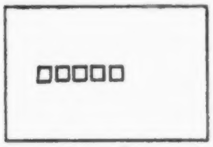
5 1107 "Square" and "rectangle" are basic geometric terms used in this problem. In the small-group session have students take 6 pre-cut squares, and physically make the 2 rectangles. (Be sure and emphasize that these are the only two, since any other rectangles would be the same as these if they were turned.) Then do the same, but with 10 squares. Continue this several more times.

This problem can later be used as an introduction to prime and composite numbers.

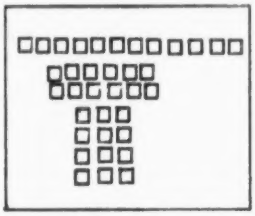
ANSWER:



For 10 sq.



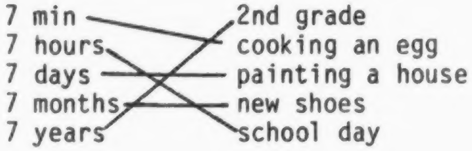
For 5 sq.



For 12 squares

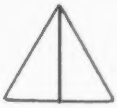
6 1035 Students should answer this, based on their personal knowledge of time periods. They may have to choose some answers (painting a house) by process of elimination, rather than direct knowledge.

ANSWER:


7 min
7 hours
7 days
7 months
7 years
2nd grade
cooking an egg
painting a house
new shoes
school day

7 1007 Sequential geometric patterning is at the heart of this problem. Some students will see the same basic shape in each figure, but rotated counterclockwise.

ANSWER:



Grade 2 , Worksheet XV

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1001 1003	This multi-step word problem can be solved by computation (7+6 - 3-2), or by "acting it out" or "drawing a diagram" and counting. ANSWER: 8
2	1004 1005	This problem can be solved by "guess-check-revise" or "working backward." If students use "guess-check-revise," they'll simply guess a number to go in the space, check it out, and revise their guess if necessary. They'll continue this process till they get the answer. If they "work backward," they can ask themselves "what number did I have in the last step, before subtracting 7. It had to be 90. What number did I have to have in the previous step so that, after adding 6, I got 90. It had to be 84." Go over several similar problems in your small-group session. ANSWER: 84
3	1017	Students should be encouraged to find the total amount by counting, going from the largest to the smallest valued coins. ANSWER: 67¢ or $.67
4,5	1051	Taken together, these two problems should help children realize that 1/2 > 1/3 > 1/4, a fact they tend to disbelieve unless their knowledge of fractions has a firm foundation in concrete experiences. In the small-group session, go over a similar situation, but use a pie, cake, or cookie example. ANSWERS: 4) 1/4, 1/3, 1/2 5) 1/2 is the largest

6 1073 In the small-group session, remind children that even numbers are those that can be divided equally between 2 people. Have them go over several examples of odd vs. even numbers in this manner. Eventually, have them learn that the even numbers are "counting by 2's, starting with 0." The odd numbers are "counting by 2's, starting with 1." (This generalization will be useful next week.)

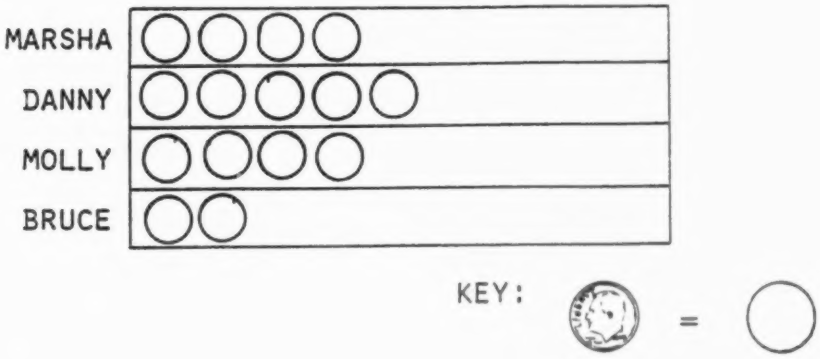
ANSWER: even

7 1122 Students might need to use a calculator to add 60 + 60.

ANSWER: 120

8 1147 Students have a chance to make their own pictograph in this problem. In the small-group session, have them notice the key (or legend) at the bottom of the graph. They can consider a related problem to this one, and actually make a graph using play money in the session.

ANSWER:



Grade 2 , Worksheet XVI

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1002 1004	The student might approach this problem with "guess-check-revise." They would say something like "Suppose I have 2 of each coin. That'll be 30¢, which isn't enough. So I'll try 3 of each type." Or they might make a list, like 1 dime, 1 nickel = 15¢; 2 dimes, 2 nickels = 30¢; etc., till they find the answer. In your small-group session, go over a similar problem, perhaps with other coins. ANSWER: 3, 3
2	1003	Students can be encouraged to solve this by "acting it out" or "drawing a sketch." They won't have the computational skill to solve 1 1/2 + 2 1/2 + 3, but they can intuitively and concretely put two halves together to get a whole. Go over a similar problem in the small-group session. ANSWER: 7
3	1145	The student must read this table carefully. The first problem lays an intuitive notion of "mode." Some students will miss the second question because they won't count Angie herself. ANSWERS: (A) 3 (B) 1
4	1110	This figure is a simple closed curve, which is like a circle in that it divides the plane into the curve itself, and the inside, and the outside. Have students take a loop of string and make various simple closed curves (they can't "cross themselves," as in ∞). ANSWER: B C A

5 1074 The students can practice on algebraic equalities similar to these by making some true addition/subtraction statements on 3x5 cards, covering up one of the numbers and asking another student to find the missing number. If students are having difficulty, you might want to use manipulatives.

ANSWER: 15, 25, 70

6 1073 Some students will not know the even from odd numbers. You might give them an oral "counting by 2's" exercise, starting with 0 for even numbers and 1 for odd numbers, until they notice the ending digit patterns for both.

ANSWER: 218

7 1048 Students are introduced to solving addition problems via "mental arithmetic" methods in this problem. These practice problems do not "bridge a decade," except for F, H, and I. But these should be easily done also since the student winds up adding multiples of ten mentally.

The importance of this problem can't be overemphasized. You should gradually, over the rest of the school year, extend the difficulty of the problems you ask students to use this method on, to these types:

(a) 2-digits + 2-digits, bridging a decade
(b) 3-digits + 3-digits, not bridging a decade
(c) 3-digits + 1- or 2-digits, not bridging a decade.

In the 3rd grade, students should also practice this skill, on harder problems.

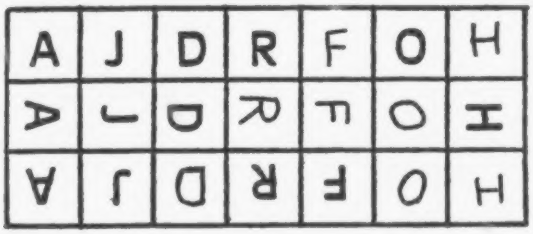
When the student turns in his/her paper, have them do this problem in their head, and write the answer only after they're through:

63 + 24

ANSWER: 87

Grade 2 , Worksheet XVII

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1006	Visual discrimination is involved in solving this problem. For the small-group session, have 3 cut out alphabetical letters for A, J, D, R, F, O, and H, and have students arrange them according to the pattern. ANSWER: 
2	1001	The student must realize that there are 7 girls at the party. 1 package of balloons won't be enough, but 2 will be too many balloons. But she'll have to buy two packages and have some left. The same concept applies to the hats. Have students do a similar problem in the small-group session, perhaps with real packaged items (gum, etc.). ANSWERS: 2, 4
3	1017	The student has to find the value of a given coin collection, and then "round that value off" to either 25¢ or 50¢. Go over 2 similar problems in the small group session, a collection that rounds off to 25¢, and one which rounds off to 50¢. ANSWER: The half-dollar.
4	1051	Students are to determine that 1/2 > 1/3 or 1/4 from looking at these pictures. This problem is similar to a problem from last week's worksheet. ANSWER: 1/2

5 1002 Students can be encouraged to solve this problem by "making a list." In the small-group session, start off their list with 4 or 5 numbers, and let them finish the list.

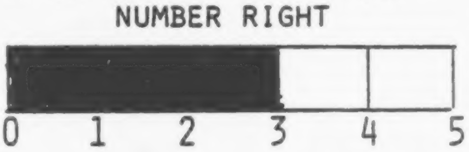
ANSWER: 12

6 1123 Most students will realize that the time will be half-way between 1:00 and 2:00, but they may not know exactly how to write that time.

ANSWER: 1:30

7 1145 Students actually collect data for this problem, and then make a graph with it. In the small-group session, have them grade another paper with a few problems on it, and make a similar graph.

ANSWER:

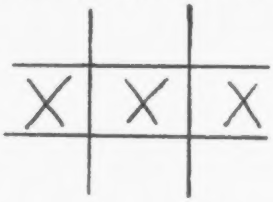


8 -- Students are dealing with a ratio in this problem. If 1 pint = 2 cups, then 1/2 pint = ? cups. In the small-group session, go over a similar problem with quarts and a half-gallon milk container.

ANSWER: 1 cup

Grade 2, Worksheet XVIII

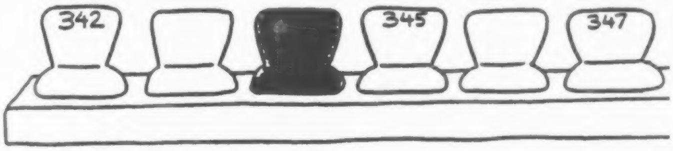
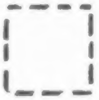
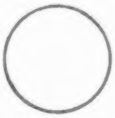
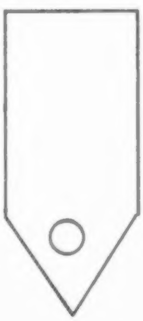
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1004 1050	This puzzle will probably be solved with a modified "guess-check-revise" technique. In the small-group session, be sure that students realize all the possibilities to check (anywhere there're 3 numbers in a row) but that they can eliminate some as too large through mental arithmetic, as on problem 7 of worksheet XVI. They can also use a calculator, if the computation is too difficult. ANSWER: 
2	1001 1003	This multi-step word problem involves addition and subtraction, but you might suggest "drawing a diagram" for students having difficulty. ANSWER: 15
3	1006 1127	The student who has trouble visualizing the cubes that aren't shown, can make such a figure and count them. ANSWER: 20
4	1146	In your small-group session, have students take their fingers and trace the steps to get to M and A. ANSWER: Math is FUN.
5	1004 1168	Students will probably use "guess-check-revise" to solve this problem. Use of a calculator is encouraged since the computation might be too difficult for some students. ANSWER: 14, 15, 16

6	1022	Some students will miss this problem by counting each name as many times as it appears on the chart. In the small-group session, use the chart given but ask different questions that require students to read and interpret the chart. ANSWER: 7
7	1035	Students are expected to have some "real world" knowledge to answer this question correctly. Those who have trouble can perhaps visit a store on the way home from school to gain an approximate answer. ANSWER: A. 35¢

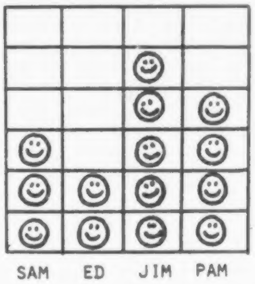
Grade 2 , Worksheet XIX

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1050	In the small-group session, consider several problems similar to this one, but have the problem written on paper with the number actually torn off. ANSWER: 4
2	1036	The student has a chance to estimate the area of a figure, using a non-standard unit of measure. In the small-group session, have them find the area of another shape--perhaps a closed hand--using this thumbprint. They can draw circles that are about the size of the thumbprint, to "cover it." ANSWER: Accept any answer between 22 and 27
3	1007	In the small-group session, go over a similar problem, perhaps with a string of numbered tickets to a theater. ANSWER: 
4	1007	This is a simple patterning problem, but the digits are written as they would appear on a calculator display. ANSWER:  or 
5	1007	Most students will realize that this geometric figure has been turned clockwise through a right angle, moving from left-to-right. ANSWER: 

6 1144 Encourage students to notice the key at the top of the chart. They can determine the answer to part B either by skip counting (5, 10), or by adding 5 + 5 = 10.

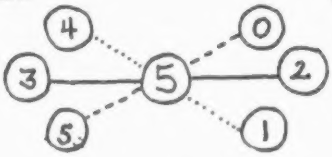
ANSWER: A. B. 10



7 1050 Students might solve this problem by "guessing-and-checking," or by deducing that each opposite pair of numbers on a line must total 5.

Have them do a similar problem in the small-group session (with a number other than 5 in the center).

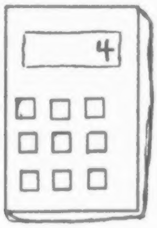
ANSWER:



(Or other versions in which 4 & 1 are paired, 5 & 0 are paired, and 3 & 2 are paired.)

8 1170 1007 Students can determine that 4 is the covered digit by process of elimination, or by noticing the pattern of keys (1,2,3,?,5,6...) starting at the bottom of the calculator. They must write 4 in the right-hand side of the display to earn this star, however.

ANSWER:



Grade 2 , Worksheet XX

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1126	The student is to find the area of this figure by counting unit squares. This is the first worksheet in which half-squares are encountered. In your small-group session, have a few similar figures drawn on grid paper, and some square centimeters that can be cut with scissors--have the students cover the drawn figures with whole unit squares, and then cut "half-squares" to cover the extra pieces. The emphasis should be on an intuitive interpretation that 2 half-squares can be "put together" to make a whole square. ANSWER: 19
2	1003	The student is to have both a diagram, and the correct numerical answer, to get credit for the problem. Emphasize to students that, even though they probably could have answered this problem without a diagram, this is a good way to begin trying to understand problems that they don't know how to answer. ANSWER: The diagram should show all 14 hops.
3	1168	The purpose of this problem is to have the student learn to use a calculator to solve basic addition and subtraction problems. You might notice that, in the last 2 problems, students would probably not know what to do unless they had a calculator. ANSWERS: 126 235 52 23

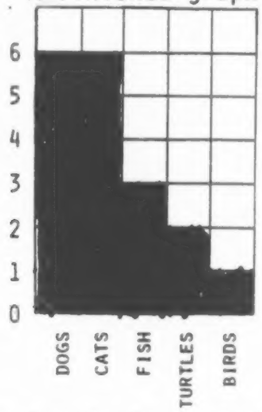
4 1110 In your small-group session, have some similar figures drawn for students to work on briefly. Be sure they understand that they're looking for a figure that can be completely drawn without lifting the pencil, or retracing a path, once started. They should also note that, in some "traceable" figures, you have to start at the right place to do so.

This problem is from an area of geometry called "topology." The figure on the far right is the only one that is "traceable" in the manner described. Notice that it has 4 vertices (points where the paths meet), and they're all "even" since they all have an even number of paths coming from them. The other two networks are not traceable, and notice that each of them has 4 vertices that would be called "odd" by the number of paths coming out from it. Whether a network is traceable or not depends on the number of "odd vertices."

ANSWER: The figure on the far right should be circled.

5 1145 This problem is designed to reinforce the skill on constructing a bar graph. Students would shape in the graph according to the information given in the problem. A finished graph is shown below:

ANSWER:



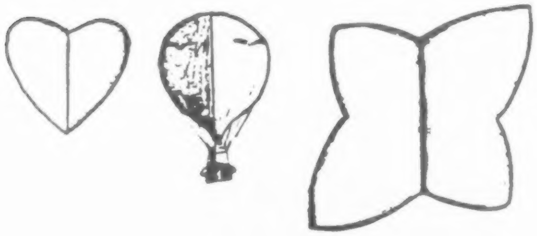
6 1153 This experiment gives students the opportunity to collect and record data in a simple probability experiment. In your small-group session, have the entire group do the experiment together, just to be sure they understand how to make tally marks, determine the "up face," etc. Also be sure that they understand that they may have to circle more than 1 face.

ANSWER: Check to be sure their tally marks total 25, and that they circled the face(s) with the most marks.

Grade 2 , Worksheet XXI

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1017	Most students should get this problem, even those who think of adding on the tax. ANSWER: paint set
2	1035	The student has to use the visual clues to determine that the pies left are closer to 2 1/2, than to either 2 or 3. Consider several similar problems in the small-group session, some of which "round off" to 2, some of which "round off" to 3, and some to 2 1/2. ANSWER: B.
3	1046	Simple addition and subtraction skills are reinforced prior to asking the student to determine the relationship between 2 numbers. In the small-group session, first review > and <, and then do a couple of similar problems with different outcomes at the final step. ANSWER: <
4	1074	Students might solve these problems by first putting them in vertical format, and then applying logic to determine the digits one-at-a-time. Or they might "work backwards" by subtracting, adding, and subtracting respectively, to find the missing numbers. Do several similar problems in the small-group session, with correct numbers actually covered up by a piece of paper, to get across the concept. ANSWER: 43, 31, 45
5	1108	This activity will lead into an understanding of lines of symmetry in the upper grades. It will also reinforce the concept of 1/2 as a fraction. This is preliminary to skill 1108.



These should be colored.

6	1122 1009	In this problem the student is asked to convert weeks into days. Extraneous information has been added to the problem as a distractor. ANSWER: 14 days
7	1168 1170	This activity reinforces the use of a calculator to make calculations. You may point out that the associative principle applies here - you may add the numbers in any order and still come up with the same answer. You might also have to point out that they have to use + two times, and the = also. Some will also not realize that they have to press • at the right time. ANSWER: $31.33
8	1002 1004	Students are likely to solve this by "guessing and checking" until they get the right answer. Another problem organizer would be to list all the numbers that add to 21, and check the list till you find the pair in which one number is 3 greater than its partner. In your small-group session, do a similar problem like "what two numbers have a sum of 20, and one is 4 more than the other?" ANSWER: 9, 12

Grade 2 , Worksheet XXII

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1001	This is a multi-step word problem, broken down into the steps. The students can get the answer either by adding whole numbers, or simply by counting. It's also a good problem to solve by drawing a diagram (skill 1003)--the simpler, the better. ANSWER: 13 females 10 males 23 people on the bus NOTE: 24 if student counts a bus driver
2	1002	Students are to solve this problem by making a list. In your small-group session, consider a similar problem such as "2 shirts, 3 pants of different colors. How many outfits?" The students should list all of them. ANSWER: (red, blue) (blue, blue) (yellow, blue) (red, white) (blue, white) (yellow, white) (red, green) (blue, green) (yellow, green) The order of the list above isn't important.
3	1030	This problem is a subskill for rounding off money values so you can estimate the solution to a money problem. In the small-group session, have coins taped to a number line (a dime to "10," etc.), and consider similarly priced objects. Students would place the object where it belongs on the number line, and then determine which coin it is closest to. ANSWERS: balloon: dime car: half-dollar ball: quarter bear: half-dollar ring: dime
4	1021 1009	The essence of this problem is to know that Howard watches t.v. from 11:15-12:15, and from 12:30-1:30. Students should realize that 1 hour passes from 11:15-12:15, with computation, and the same for 12:30-1:30. ANSWER: 2 hours

5 1166 Have a similar problem for students to do in class, such as arranging these 3x5 cards in order to eat a banana:

Peel banana

Throw away peel

Eat banana

Get banana

STOP PLAYING

START PLAYING

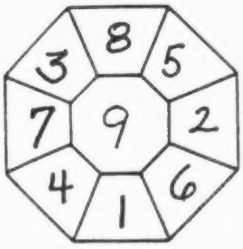
ANSWER:

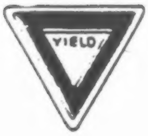
Get the leash.
Get the alligator.
Put the leash on the alligator.
Open the door.
Take the alligator outside.

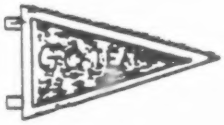
Note: Steps 1 and 2 above might be reversed.

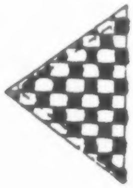
Grade 2 , Worksheet XXIII

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1050 1004 1005	Students might approach this puzzle by simple "guess-check-revise," or they might mentally "work backwards" to determine that the opposite numbers must sum to 9. If so, they just write down such number pairs in opposite boxes. In the small-group session, have the same figure with 9 in the center, and pick number pairs from 2 through 9 to give a sum of 20. ANSWER: one answer (Others can be checked by ensuring that "opposite numbers" add to 9.) 
2	1124	In your small-group session, consider similar problems. Ask the students how they can tell that the marks "go up by 2" instead of 1 (they can start at 40, e.g., and count "42, 44, 46, 48, 50;" landing on 50 at the same time they count it means the marks go up by 2). ANSWER: 3rd thermometer from left.
3	1167	The student follows this "coded flowchart" that goes right-to-left. ANSWERS: $\boxed{39}$ $\boxed{80}$ $\boxed{57}$
4	1107	"Triangle" is being reinforced in this problem. ANSWERS:

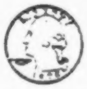
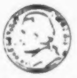
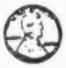
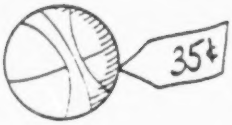
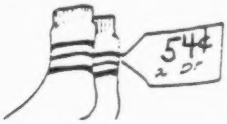






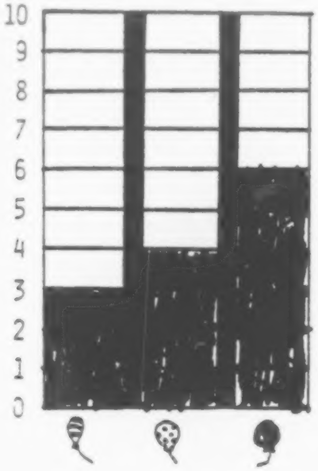
5 1019 Students can consider similar problems to this one in a small-group session. Encourage them to "count up" from the cost of the item to 75¢, and record each coin value they use. (Be sure they start with the largest coin possible, in counting back the change.)

ANSWER:

				
	1	1	1	
		2		1

Grade 2, Worksheet XXIV

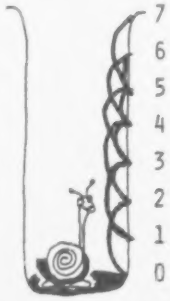
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1001	Students can use the drawing of a carton of eggs to find out how much "half a dozen" is. They simply divide the carton in half, and count. Students can solve a similar problem in your small-group session, perhaps involving a six-pack of cola. ANSWER: 15 eggs
2	1009	In the small-group session, ask students which information is unnecessary to solve the problem. Have them mark out this whole sentence and solve the problem later on. ANSWER: 95 miles
3	1145	In your small-group session, have students fill in just one of the balloon types, and finish the other two at home. ANSWER:  Students are to make a bar graph using data give in the problem.
4	1020	Students can use a calculator to solve this real-world problem, if they need to. Consider a similar problem in class, perhaps "$2.25 per week, saved for a month." ANSWER: $5.25

5	1020	In later grades, this problem will be solved by division ($10 - 1.75). At this stage, students can solve it by simply adding $1.75 to itself continously, till they get over $10, and counting the number of addends. Do a similar problem in the small-group session. (This is a good chance to show them the value of the "repeating function" characteristic of most calculators--i.e., 1.75 + 1.75 = = = = produces $10.50 as the answer.) ANSWER: 6 weeks
6	1125	Have students discuss how they measured the length of the star's tail. Some will trace the wand, and use the tracing, some might cut off a length that long and use their "real object," etc. ANSWERS: 2 2 1/2 or 3 3 1/2 or 4

Grade 2 , Worksheet XXV

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1003	In your small-group session, have students do a similar problem about a frog falling in a well. They should actually draw the diagram, as in  ANSWER: 6 hours
2	1035	Be sure students understand the difference in \$ and ¢. ANSWER: Bicycle \$80 Barbie doll \$8 Balloons 80¢ Computer \$800
3	1126	Students met this same sort of problem in worksheet XX of this set. This should give them another chance to show they can count whole unit squares, and put two "half-squares" together in counting. ANSWER: 13
4	1050	By now, students should be familiar with such problems. However, the last two problems here involve "carrying" and "borrowing," for the first time. You might have several such problems written on paper (with "carrying" and "borrowing"), with covered-up digits for the small-group to solve. ANSWERS: $\begin{array}{r} 15 \\ +21 \\ \hline 36 \end{array}$ $\begin{array}{r} 26 \\ -14 \\ \hline 12 \end{array}$ $\begin{array}{r} 53 \\ +28 \\ \hline 81 \end{array}$ $\begin{array}{r} 94 \\ -38 \\ \hline 56 \end{array}$

5	1169 1035	The essence of this problem is to have children realize that answers on a calculator aren't always correct. Since Josie's best friend was in the 2nd grade-same as these students-an answer of "21" would not be reasonable. ANSWER: NO
6	1003	Students will probably miss this the first time, because they think that 2 pieces would require 2 cuts (of 5 minutes each) instead of only 1. Have them act it out, or draw a sketch. This should help them see that only 2 cuts are required, at 10 min. each, to get 3 pieces. ANSWER: 20 minutes
7	1003	Students will likely forget to count themselves. Acting this out, or drawing a sketch, helps them find their error. Have them draw a sketch of a similar problem. ANSWER: 21

TEACHER COMMENTARY
FOR
GRADE 3 WORKSHEETS

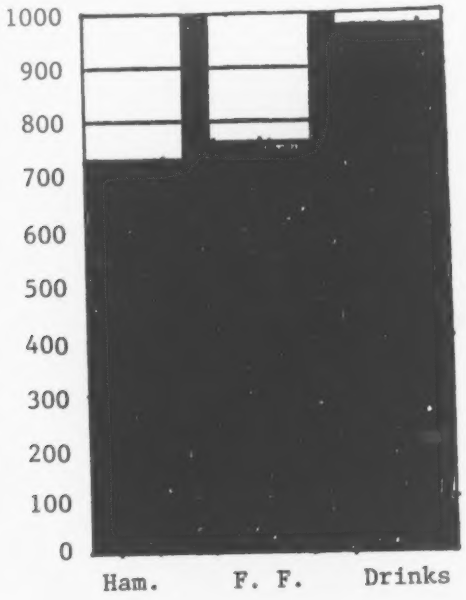
Grade 3, Worksheet I

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1001 1003	Encourage students who don't know how to solve this problem to begin by making a sketch. They might draw 22 "stick men" and mark out 4, and then "group by 9's" till they have exhausted the stick men. This corresponds to mathematically subtracting 4 from 22, and then dividing the result by 9. ANSWER: 2
2	1003	This problem is similar to problems in Grade 1, Worksheet XXV and Grade 2, Worksheet XXV. In your small-group session, you might start off their drawing for them by making the first couple of 3-foot climbs and 1-foot slips. The students can finish the sketch by themselves. ANSWER: 5
3	1020	Students will probably solve this problem by addition, but the foundation is there for this to be a multiplication problem. The numbers are easy enough to deal with so that an "intuitive thinker" might solve it by simply counting "1 1/2 dollars, 3 dollars, 4 1/2 dollars, etc." ANSWER: $9
4	1031	In your small-group session, measure only one of the three things listed in the chart--students can measure the other two at home, to earn the stars. ANSWER: 11 4 9 3 7 3

5 1145 Graph just one of the foods in your small-group session (perhaps hamburgers) as a group, on the board. The students complete the graph at home, for all three foods.

ANSWER: see below



6 1128 Do a similar problem in class, but using two children on a see-saw, with known weights.

ANSWER: b

7 1048 "Mental arithmetic" is the alternative to the usual "paper-and-pencil" algorithm that is being reinforced in this problem. Consider a few examples in class similar to those on the worksheet (problems for which it is easy to mentally "go up to" the next hundred).

To earn their stars, have this problem taped to the table where they turn in their papers--they work it mentally, and whisper their result to you. Give them credit if they give you the correct answer verbally.

ANSWER: Problem taped to desk--

WIN $1000, BUY GIFTS TOTALING $697,
HOW MUCH CHANGE FOR A $1000 BILL?

The answer is $303.

Grade 3 , Worksheet II

TEACHER COMMENTARY

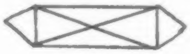
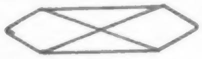
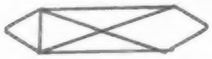
Problem	Skill of Excellence	Comment
1	1001 1003	This exercise leads the child to solve a multi-step word problem, through several steps. In (a), the student would probably realize that 2 cows have 8 legs, so the rest of the legs--10--would be for chickens. This would be 5 chickens. For (b), the situation is reversed--6 chickens would have 12 legs, so the legs left (24-12=12) would be for the cows. This would be 3 cows. The last problem has the child compute (or count) the legs on 5 cows--20--and add that to the number of legs on 3 chickens--6. So the total would be 26 legs. Note that a student might solve these problems either with arithmetic, or by drawing a diagram and counting. Go over a similar problem in your small-group session. ANSWER: (a) 10 (b) 3 (c) 26
2	1170 1004	These three problems give students the opportunity to interact with a calculator, in an interesting fashion. They would probably solve them with a modified "guess-check-revise" technique--guessing how to put the digits together, to give the answer shown on the display. Go over a similar problem in your small-group session. ANSWER: 48 + 26 = 74, or 28 + 46 = 74 48 + 36 = 84, or 38 + 46 = 84 14 + 68 = 82, or 64 + 18 = 82
3	1003	Students can arrive at this answer by drawing a diagram and counting the clothespins, or perhaps by reasoning in an inductive fashion--since 5 pins would hold 4 towels, 14 would hold 14-1 or 13 towels. Simply mention to the students that if they're unsure, they can make a sketch of the problem. ANSWER: 13 towels

4 1004 Students will probably solve this problem using a modified "guess-check-revise" technique. It's probably easier to start guessing by looking at the "clues on the extremes--the ones that have either high or low costs." For example, the 2nd clue tells you that either a brush or an apple is 10¢, and the other is 5¢--so you can work from there. Or the last clue, by itself, says that either a ball or a brush is 30¢, while the other is 10¢.

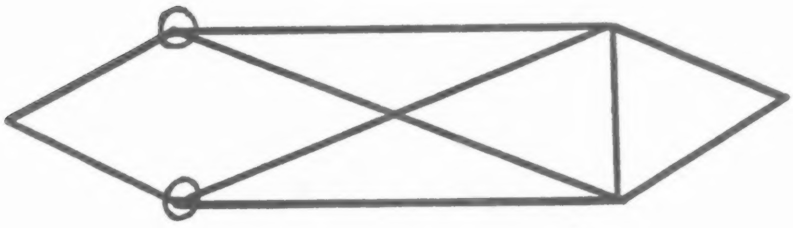
In your small-group session, ask a successful student how he/she started the problem.

ANSWER: ball: 30¢
apple: 5¢
pencil: 12¢
brush: 10¢
car: 15¢

5 1110 In your small-group session, be sure students understand what they're asked to do. Take a couple of similar figures to do as a class, on the board.

One like  can be traced by starting anywhere. But one like  can't be traced at all. Yet  can be traced by starting at the upper right or bottom right corners.

ANSWER: The bottom figure can be traced by starting at either of the circled points.



Grade 3, Worksheet III

TEACHER COMMENTARY

<table>
<tr><th>Problem</th><th>Skill of Excellence</th><th>Comment</th></tr>
<tr><td>1</td><td>1001</td><td>Most students will solve this problem by adding and then subtracting. Some might draw a diagram, or simply count to find the answer.

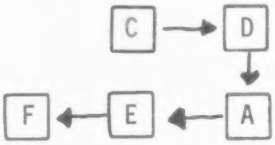
ANSWER: 3</td></tr>
<tr><td>2</td><td>1008</td><td>This is a logic problem. For students who have trouble in a similar problem, have them write
" Y 0 "
David Howard
because of the first clue, and then fill in Sandy and Jeffrey in the right place on the list.

ANSWER: David, Jeffrey</td></tr>
<tr><td>3</td><td>1001
1021</td><td>Go over a similar problem in your-small group session, or the same problem using different numbers.

ANSWER: 25 minutes</td></tr>
<tr><td>4</td><td>1050
1005</td><td>In your session, show students how they can "work backwards" by starting with the diagonal sum, and finding missing numbers for which you already know two addends.

ANSWERS:
<table>
<tr><td>5</td><td>4</td><td>9</td></tr>
<tr><td>10</td><td>6</td><td>2</td></tr>
<tr><td>3</td><td>8</td><td>7</td></tr>
</table>
<table>
<tr><td>6</td><td>4</td><td>14</td></tr>
<tr><td>16</td><td>8</td><td>0</td></tr>
<tr><td>2</td><td>12</td><td>10</td></tr>
</table></td></tr>
<tr><td>5</td><td>1072</td><td>For students who have trouble, have them first place the numerals in descending order:
60,000; 4,000; 900; 20; 7.

ANSWER: 64,927</td></tr>
</table>

6	1047	This appears to be a difficult computational exercise, but it's actually very easy. ANSWER: 9 0000000000000000 9
7	1145	Students might find these answers either through addition or multiplication. In your small-group session, go over only Long's length. ANSWER: 60 34 45 65
8	1125	Have students measure a similar figure in the small-group session. ANSWER: 18-19
9	1166	Students will likely have no trouble with this problem. ANSWER: 
10	1030	Provide students with a problem like this, but with blanks for the numbers. Then give them 5 or 6 sets of numbers to go in the blanks, and have them "round off" the money amounts and find the answer through estimation. Be sure they have some to practice with at home, together with answers. ANSWER: Cut this problem out, and tape it to the table where you take up the worksheets. Students can read it without a pencil in their hands; when they have an answer, they can whisper it to you and you write it on their paper. (The answer is "yes.")

David received $3.00 for mowing the lawn. He wants to buy some toys at the toystore. He has chosen a kite for $1.49, a toy car for $.79 and a mask for $.39. Can he buy all of these toys?
Solution: $1.50 + $.80 + $.40 = $2.70

Answer: Yes. ($2.70 < $3.00)

Grade 3, Worksheet IV

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1001	Students will use addition and subtraction to solve this problem, or perhaps draw a diagram, and count. ANSWER: 23
2	1004 1005	Have students who were successful on this problem share how they began. It will probably involve either "guess-check-revise"--they'll guess the answer, and check it by adding 5, subtracting 6, then adding 2. If they don't get 20, they'll revise the guess. Another way is to "work backward" by asking "what did I have to have before adding 2 to get 20." I had 18. They continue reversing the steps to arrive at the starting number. ANSWER: 19
3	1017	Encourage students to count the larger coin values first, and then add on the smaller values. Or, look for coin values that add up to a dollar in counting. Watch for a student who writes \$2.1 or \$2.10 instead of \$2.01 ANSWER: \$2.01
4,5	1051	These two problems are intended as concrete reinforcement for equality between fractions. Have several similar problems for students in the small-group session. ANSWER: (4) 1/4 2/8 (5) equal to
6	1073	In your small-group session, encourage students to say the even or odd numbers in sequence orally, to themselves, till they notice a pattern. Elicit that the odd numbers end in 1,3,5,7,or 9, and the even numbers in 0,2,4,6,or 8. ANSWER: odd, even, odd, even, even

7	1144	Use the graph, but ask students a different question from the one on the worksheet. Some will solve the problem by calculating the totals for both cities and subtracting - others will simply count "50,100,etc..." as many times as necessary to find the difference, depending on the "extra" symbols one city has over the other. ANSWER: 100
8	1122	Students will probably know that 60 seconds=1 minute, so they can add 60 and 60 for 2 minutes. Many will intuitively realize that "half of 60 is 30," so 2 1/2 minutes is 120 + 30 seconds. Do a similar problem in class. Do not become formal with the computation. ANSWER: 150
9	1036 1107	Take a similar problem in class - perhaps with a square that's 4 inches on a side. Have the students use string to measure the circumference of the circle. ANSWER: (B)
10	1047	This is a challenging computational problem, but gives a nice pattern in the answer. ANSWER: 40000991111
11	1107 1006	Be sure students know what a rectangle is. Encourage them to start looking in an organized fashion - smallest first then next largest, etc., till they have counted all the rectangles, including the largest. ANSWER: 6

Grade 3 , Worksheet V

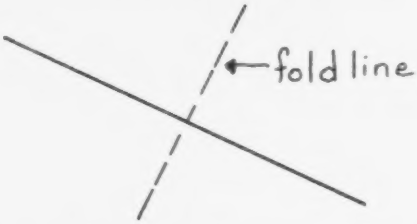
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1003 1007	Students will probably notice that these 3 figures all have a "square base" with a roof on it. The next shape would be a square base with 25 dots, and a "roof" of 10 dots. Observing the "square base" and "roof" in your small-group session should be sufficient help. ANSWER: 35
2	1001 1019 1020	Take a similar problem for the small-group to solve, noting they have to add the tax to the total cost, and then subtract from the amount of money shown [or, "count up" from the total, to the amount]. ANSWER: 7¢
3	1074 1004 1005	Students might solve this simple algebraic equation either by "guess-check-revise" or by "working backward." If they use "guess-check-revise"-they'll guess a first number to go in the box, and check it to see if, when added to 96, they get 247. If not, they'll revise the guess either up or down, and guess again. They might "work backwards" if they mentally turn the addition format into one that requires subtraction, i.e., the missing number can be found by doing "247 - 96." ANSWER: 151

4 1111 Students have a chance to learn what "bisect a line segment" means in this problem. The purpose is to approach this construction problem that's typically done with straight-edge and compass, through paper-folding, concentrating on an intuitive understanding of the problem. Even though it's not mentioned in the problem, point out to the students later that the crease they make (if they do it correctly, by matching-up the end points) gives them the "perpendicular bisector" of the line segment.

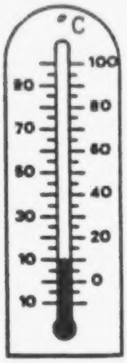
Note: Some students might use a ruler to bisect the segment in half, and then fold the paper. Give them credit, but point out that the ruler isn't necessary.

ANSWER:

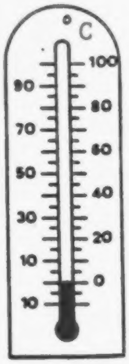


5 1124 Students have a chance to show that they understand temperature measurement in this problem, and how to record it using a thermometer. The readings were set up to carry a student from a positive reading (+10°), to zero, to the negative side of the scale (-10°). In your problem-solving session, do a similar problem. Also ask students "what season of the year was this in--winter, spring, summer, or fall?" This will reinforce skill 1035 - giving reasonable answers based on personal knowledge, rather than rounding and computing.

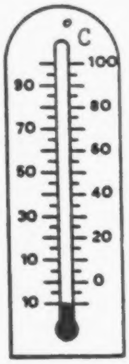
ANSWER:



Friday



Saturday



Sunday

6 1155 1156 These two problems have the students deal with probability, and the complement, in a realistic, real-world situation. In your small-group session, have the students color 5 of the shirts red, and go through the similar problem "what are the chances of getting a red shirt" and "not getting a red shirt?" Be sure to use the interpretation of a fraction as the ratio of a subset (red shirts) to the set itself (all the shirts). Explain to the students that 5 of the 12 shirts are red, so 5/12 (read "5 out of 12") is the fraction that shows the chances of getting a red shirt. Since 7 of the shirts are not red, the chances of not getting one would be 7/12 (read "7 out of 12"). Do not try to teach finding the complement via "subtracting from one," and do not try to reduce the fractions to the lowest terms.

ANSWER: 3/12 and 9/12

7 1048 The purpose of this problem is to have students compute subtraction problems using a method other than the standard algorithm. This method is sometimes called "add a neat number;" the student looks at a problem, and decides what to add to the lower number to make it a "nice number" to subtract. They then add this same number to the top also, to produce a "slightly different" problem with the same difference as the original problem. Students should be encouraged to continue using this method at times throughout the year.

Students are not asked to do anything with the practice problems to get credit, but you can use these as "slightly different" problems in teaching the system in the small group session:

$$\begin{array}{r} 347 \\ -100 \\ \hline \end{array} \quad \begin{array}{r} 529 \\ -100 \\ \hline \end{array} \quad \begin{array}{r} 873 \\ -300 \\ \hline \end{array} \quad \begin{array}{r} 768 \\ -100 \\ \hline \end{array} \quad \begin{array}{r} 692 \\ -200 \\ \hline \end{array} \quad \begin{array}{r} 454 \\ -100 \\ \hline \end{array} \quad \begin{array}{r} 625 \\ -100 \\ \hline \end{array} \quad \begin{array}{r} 850 \\ -200 \\ \hline \end{array} \quad \begin{array}{r} 850 \\ -300 \\ \hline \end{array}$$

When they turn in their paper, give them this problem, which is taped to the desk or table. Have students work the problem mentally and write the answer on his/her paper.

$$\begin{array}{r} 472 \\ -198 \\ \hline \end{array}$$

ANSWER: Given problem Different problem

$$\begin{array}{r} 472 \\ -198 \\ \hline \end{array} \qquad \begin{array}{r} 474 \\ -200 \\ \hline \end{array}$$

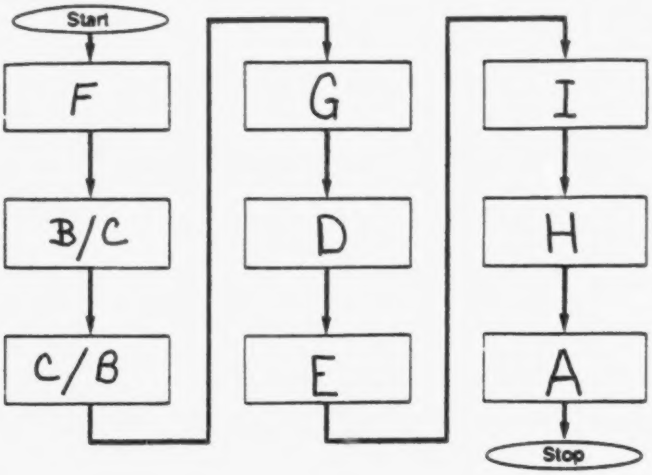
Grade 3, Worksheet VI

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1035	In your small-group session, you might do a similar problem with a different coin. ANSWER: any number for "guess" 12 for "real answer"
2	1051	Show students a real measuring cup, with 1/2 and 1/4 marked on it. Be sure they understand the essence of this problem - that 1/2 is a greater amount than 1/4, even though 2 is less than 4. ANSWER: No
3	1072	Students should learn to do problems like this by re-arranging the numerals, and not by addition. ANSWER: 343,020
4	1109	Review this method of testing angles in class. Have students use it to classify 4 or 5 other angles (at least 1 acute, 1 obtuse, and 1 right). ANSWER: Upper left, counterclockwise: acute, obtuse, right, acute, obtuse
5	1006	This problem is one that requires visual discrimination. If students will physically turn the paper in different directions, they will not focus so hard on the bull that's so obvious when it's "right side up," and have better luck finding the man. ANSWER: The man's mouth is right under the horns, slightly to the left of the middle. (The middle is the man's nose.)

6	1004 1005	This problem combines several of the skills under Standards of Excellence. Students will probably solve it by either "guess-check-revise" or "working backwards" as problem-solving strategies. For "guess-check-revise," the student would simply guess a number to go in the box, and check it out by adding 3 and multiplying the result by 2, to see if they get 14. If not, they'd revise the guess either up or down. If the student uses "working backward," they'll ask themselves "what number, multiplied by 2, gives 14?" This would give them 7 as an intermediate step. Then they'd ask "what number would I have to start with, so that after adding 3, I get 7?" ANSWER: 4
7	--	This is a word problem that has a "trick" in it--most students will forget to count themselves. It is intended to demonstrate to students that they can't just use "key words" to solve math problems. ANSWER: 21
8	1050 1005	This puzzle requires computational ingenuity and perhaps "working backward." The "working backwards" would enter the picture since the student has to "think in reverse" to solve this addition problem. Have them do a similar problem in the small-group session, one that also involves "carrying" for the missing digits. ANSWER: $\begin{array}{r} 4469 \\ +\ 718 \\ \hline 5187 \end{array}$
9,10,11	1051	These three problems are meant to be done together, to give students some justification in the real world for >, <, and = with fractions. In your small-group session, go over a similar problem with months of the year--school vs. summer--in which 9/12 > 3/12. ANSWER: (9) 5/7 (10) 2/7 (11) 5/7
12	1125	In your small-group session, have students measure the perimeter of several polygons similar to this one. The lengths of the sides should come out either in whole centimeters or half centimeters. ANSWER: 16 - 17 cm

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1123	Students can demonstrate their understanding of "elapsed time" in this problem. The first clock shows 8:15 AM, and the second shows 10:25 PM. Students can either count the hours from 8:15 till 10:15, and add on the extra 10 minutes, or they might know that there would be 12 hours from 8:15 AM till 8:15 PM, and add on the extra 2 hours and 10 minutes. ANSWER: 14 hours, 10 minutes
2	1009	This problem contains both the answer, and a lot of extraneous information. Some students will actually compute the answer: 68+12=80, and then 80-68=12. ANSWER: 12
3	1166	This is a flowchart for a common, everyday activity. Steps B and C are interchangeable, as are B and G. But C must precede G. ANSWER:  Start F B/C C/B G D E I H A Stop

4,5 1001
1006

These problems both involve estimating and approximating, and problem 4 incorporates visual discrimination. The student must notice that the gas gauge shows a little over 1/2 a tank left after their arrival, which means they used less than 1/2 tank in getting to Grandma's house. So they should be able to get back without adding gas.

The answer to the first part of problem 5 comes directly from reading the odometer and subtracting 35,102 from 35,297 (to get 195). The second part involves knowing the speed limit is 55 MPH, and adding to see that there are about 3 1/2 55's in 195. An answer of either 3 or 4 hours, or 3 1/2 hours, should be accepted.

In your small-group session, be sure to point out the 3 important features--the speedometer, the fuel guage, and the odometer.

ANSWER: (4) yes
(5) 195; 3, 3 1/2, or 4 hours are acceptable.
NOTE: If student considered round trip the above figures would be doubled.

6 1046

This problem gives students the opportunity to practice >, <, and = in an interesting puzzle. The answer is "yes," which comes from seeing the diagonal line formed by > from lower left to upper right.

In your small-group session, do the first two or three problems to be sure students understand what they're to do.

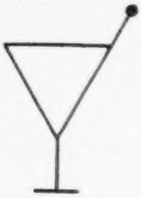
① <	② =	③ >
④ =	⑤ >	⑥ <
⑦ >	⑧ =	⑨ >

ANSWER: Yes

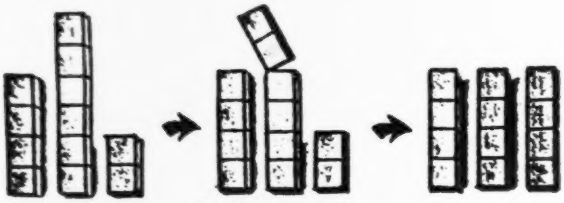
Grade 3 , Worksheet VIII

TEACHER COMMENTARY

<table>
<tr><th>Problem</th><th>Skill of Excellence</th><th>Comment</th></tr>
<tr><td>1</td><td>1006</td><td>Students will probably find the answer by counting by 7's fifteen times, rather than multiplying. They can find the answer by actually building such a figure, if they are having problems with visual discrimination. Also the teacher may bring out in a discussion setting, that this figure is a well-known optical illusion in that, 2 of the blocks "jump back and forth" if you stare at it.
ANSWER: 105</td></tr>
<tr><td>2</td><td>1050
1005</td><td>This is a puzzle that requires the student to demonstrate understanding of, and ingenuity with, computational principles. Students may solve this problem by "working backwards" mentally because they find the only sum they can (3 + 10 + 6 + 15), and then another row or column with 1 number missing (5 + 11 + 10 + 8), and keep "working backwards" till they get all the numbers correct. Give them this hint in your small-group session.
ANSWER:
<table>
<tr><td>16</td><td>2</td><td>3</td><td>13</td></tr>
<tr><td>5</td><td>11</td><td>10</td><td>8</td></tr>
<tr><td>9</td><td>7</td><td>6</td><td>12</td></tr>
<tr><td>4</td><td>14</td><td>15</td><td>1</td></tr>
</table></td></tr>
<tr><td>3</td><td>1002
1004</td><td>Some students will solve this by "guess-check-revise" (guessing various 2-digit numbers and checking against problem conditions). Others might make a list of all those with a digit sum of 5, till they get one with a reversed-digit difference of 9 from original number. In your small-group session, consider a different problem, and solve it both ways.
ANSWER: 32</td></tr>
</table>

4	1006 1007	This problem combines visual discrimination and geometric patterning. The student might notice that the features of the creatures (antenna, body shape, legs) "move" across the horizontal level from left-to-right, or from "top-to-bottom." Or they might get the answer by looking at the empty square, and finding its features by "process of elimination." ANSWER: 
5	1170	To successfully solve this problem, the student must be knowledgeable about a calculator's display. The student must realize that a calculator will, many times, eliminate unnecessary zeros in an answer such as $4.60. In your small-group session, do a problem such as $4.31 + .29, and see what happens. ANSWER: (a)
6	1126 1107	In your small-group session, consider a similar problem - find 3 rectangles with area 18. They would find a 1x18, a 2x9, and a 3x6. You can later extend this concept as an introduction to prime vs. composite numbers. Prime numbers are those for which you can only make 1 rectangle (a 1 by ?). ANSWER: The 4 rectangles would be a 1 by 24, a 2 by 12, a 3 by 8, and a 4 by 6.
7	1009	As a hint for this problem, ask the students "does it say the clock was even wound to start with?" ANSWER: 0

8 1154 Although it's not mentioned in this problem, this is an intuitive introduction to "averaging." Before students meet this word in a similar problem in a few worksheets (XII), you might want to give them several problems similar to this one and use the word "average." Approximate problems are of this nature:

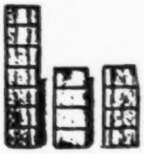


12 blocks in all Make the stacks even.

The average number of blocks in each stack is 4.

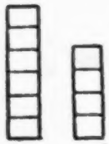
Tell the average.

1.



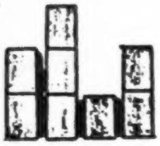
3 stacks
15 blocks in all
average? 5

3.



2 stacks
10 blocks in all
average? 5

5.



4 stacks
8 blocks in all
average? 2

ANSWER: 30

Grade 3, Worksheet IX

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1001	Students will probably solve this by repeated addition (42 + 42 + 42 + 42) or multiplication (42 x 4), followed by addition (+ 5). Solve a similar problem in your small-group session--perhaps 3 buses and 20 extra kids. ANSWER: 173
2	1003	Encourage students to draw a diagram to solve this problem. If so, perhaps they'll realize they need an extra post at one end. ANSWER: 11
3	1022	In your small-group session, ask questions that will enable you to see if the students are correctly interpreting the chart. ANSWER: Cartoons
4	1032	Consider a similar problem in your small-group session, but using a more concrete example - money. Have the students add two money values together, and round off to the nearest dime. ANSWER: 0.8
5	1050 1004 1005	This problem requires the student to solve a puzzle based on computational principles. The student may use the "guess-check-revise" method to solve the problem, or "working backward" if he or she reverses the operation and asks a correlated addition fact. ANSWER: $\begin{array}{r} 49\ 003 \\ -17\ 874 \\ \hline 21\ 129 \end{array}$

6
1109

Refresh student's mind about how to test angles (worksheet VI, #4), and what to call them (acute, obtuse, or right). Show some similar examples in class.

ANSWER: The 3rd from the left

7
1127
1006

Explain to your students that "volume" is the number of cubes it takes to make a solid figure - relate it as the 3-dimensional equivalent of "area" in 2-dimensions. Some will have difficulty counting the cubes because they can't see them all, and can't visualize them. Have these students make such a figure from common blocks or sugar cubes.

ANSWER: 27

8
1004
1002

The student might begin by simply "guessing-and-checking" numbers for the answer. Or, the student might list all the numbers and check them in an organized fashion, starting with the smallest, to be sure one isn't overlooked.

Pennies	checkout
11	x
12	x
.	
.	
.	
25	x
26	✓

ANSWER: 26

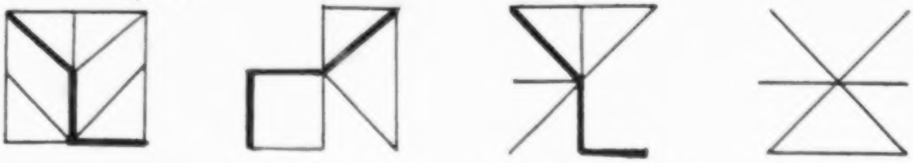
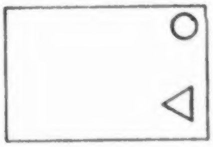
9
1107
1006

Students saw a similar problem in worksheet IV, #11. They should start counting the smallest rectangles, then the next largest size, etc.

ANSWER: 10

Grade 3 , Worksheet X

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1006	In your small-group session, you might suggest that students first simply try to determine the answer just by looking, but then trace the given shape, and twist and turn it to see if it can be found in the other shapes.  ANSWER: The first three should be circled.
2	1050 1004 1005	Students will probably either simply guess digits to go in the blanks, or determine them by adding up what is already present and mentally "working backwards," using logical reasoning. For your small-group session, have a similar addition problem with some covered digits, and students tell how they'd find them. (Be sure "carrying" is involved.) ANSWER: 3 4 9 1 8 5 6 0 5 4 2 3 7 8 0 6 2 5 2 8 0
3	1006 1007	Some students will notice that a rigid "turn" is occurring in moving from left to right. You might take this opportunity to introduce the 3 types of rigid motion in geometry: slides, flips, and turns. ANSWER: 
4	1128	This problem, or a similar one, can be briefly demonstrated in class. ANSWER: B

5	1123	In a similar problem in your small-group session, encourage students to find the answer by counting from the beginning point, by hours, to that many minutes past 12. Then they count on as far as they can, calculating the last few minutes and adding them to the hours they counted. ANSWER: 6 hours and 15 minutes
6	1170	Be sure students understand what they are to do in this problem. You might take another addition problem with sum of 80814, to demonstrate the answer. ANSWER: (c) both
7	1036	This item is designed to provide reinforcement in estimating the area of a geometric figure. It will help them to draw in the lines from point to point, and count half squares, etc. ANSWER: B. about 8 squares
8	1166	This problem is designed to help a student follow the logic of a flowchart for a daily activity. ANSWER: B. Wait for the toast to pop up.

Grade 3 , Worksheet XI

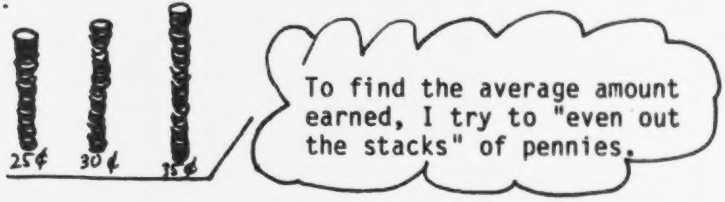
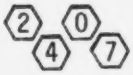
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1009	This word problem includes extraneous information. The computation involved is subtraction of 2-digit numerals with regrouping. ANSWER: 17 kilometers
2	1018 1001	The student must compute the total cost of several items, including tax. Computation involves column addition with regrouping. It is a two-step problem because a subtotal must be calculated before tax can be determined. In your problem-solving session, use the chart with a similar problem. ANSWER: $2.66
3	1035	The student must use his personal knowledge (of measurement) to give a reasonable response. Computation or estimation will not help the student derive an answer. ANSWER: grams
4	1050 1005	Students will probably solve this problem by mentally "working backwards" to find each digit, moving right-to-left. Go over a similar problem - one that involves "borrowing" - in your small-group session. ANSWER: $\begin{array}{r} 4\ 9\ 6\ 4\ 3 \\ -2\ 0\ 3\ 2\ 5 \\ \hline 2\ 9\ 3\ 1\ 8 \end{array}$
5	--	Encourage students to share all of their ways to find the answer, some of which might be surprising. ANSWER: 109

6	1046	Do a similar problem for the students. Many will be confused by the fact that they are to compare expressions, rather than simply numbers. ANSWER: <
7	1021 1123	Have students solve a similar problem in school. ANSWER: Yes
8	1145 1150	Use the pictograph in your small-group session, but ask other questions. ANSWERS: (A) Mary, Susan, Tom (B) 5 (C) 7
9	1168	A calculator must be used to perform this computation. The comma will cause a problem for some students, as will converting $23\overline{)117{,}461}$ into $117461 \div 23$. ANSWER: LOIS

Grade 3 , Worksheet XII

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1154	If students have trouble with this problem, they either don't know a process for finding the average, or they perhaps don't know how to divide. You can help them with the concept of averaging, without explicit referral to division, by having them think in this way:  25¢ 30¢ 35¢ To find the average amount earned, I try to "even out the stacks" of pennies. In your small-group session, have pennies stacked up as shown, and tell them to make all 3 stacks equal to find the average, and report how high each "evened out" stack would be. They can actually do this at home, if they want the stars. Note: This problem was introduced intuitively in worksheet VIII. ANSWER: 30¢
2	1050 1005	This problem is one that requires ingenuity with computation. ANSWER: 
3	1018 1001	Be sure students can find the sales tax by counting 5¢ for every dollar spent. Practice orally with amounts like $9, $11, etc., having students count 5, 10, 15, 20, etc. Be sure they also know to add the tax back to the amount spent. ANSWER: $15.75
4	1128	Demonstrate a couple of problems like this, using some standard weights and familiar classroom objects. ANSWER: B

5 1030 Students should solve this problem by thinking of 89¢ as "close to" one dollar, and the same for 93¢ (do not teach "rules for rounding"). Therefore, the change would be "close to" $5, $2, or $3. Go over a similar problem in your small-group session.

ANSWER: (c) $3

6 1144 The chart is a pictograph, with a key below the graph. Students might find the kid with perfect attendance by computing 180 - 30 = 6, and then looking for someone with 6 "happy faces." Or they might just count by 30 for each "happy face," and find the child who has 180 days' worth.

ANSWER: Jo

7 1004 Students who find the answer to this problem will probably be using "guess-check-revise," in that they'll make a first guess at the dog or cat's weight, and double or halve that for the other's weight, and check to see if they get 27. If not, they'll use the knowledge gained in the first guess, to revise the guess. (They might use a "modified" first guess, by realizing that the dog's weight has to be an even number.)

Take a similar problem in your small-group session, and solve it together by "guess-check-revise."

ANSWER: 18, 9

8 1128 This is one of those "trick questions" the first time you hear it. The natural tendency is to think of cotton as lighter than lead; this is true of the density of the two. A follow-up discussion should clarify this point for students.

ANSWER: They're the same weight.

9 1004 Students will use "guess-check-revise" to solve this problem also (since they don't know algebra). They'll guess at one of the pages, and then add that page and the next, consecutive page, to see if the total is 53. If not, they'll use the knowledge gained to revise their guess either up or down, and guess again.

In your small-group session, solve a similar problem and check the answer by opening a book to the pages and adding on a calculator.

ANSWER: 26 and 27

Grade 3, Worksheet XIII

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1126	Students have previously been introduced to counting whole and half-squares to find the area of a figure - this problem should provide practice in this. The only difficult part might be that in the chimney of the house, students must think of "putting together" 2 half-squares that aren't visually the same. ANSWERS: 35, 15, 5
2	1010	The student is to read the information in the chart, and make a conclusion about the size of the animal in comparison to the heartbeats per minute. This gives the student the opportunity to form a tentative hypothesis in a problem-solving situation. ANSWER: slower, less, or an equivalent word that gets across the meaning.
3	1019	Getting change for a purchase is being reinforced in this problem situation. Notice that the answers are all in terms of the actual coins one might get back in such a situation, rather than using standard "dollar and cents" notation. The problem can therefore be solved by "counting up" rather than computing. ANSWER: (c)
4	1046 1054	Recognizing >, <, and =, and the use of parentheses, are combined in this problem. Go over several similar problems in class, emphasizing evaluating both sides independently before making a judgement about >, <, or =. Also include one or two examples (similar to the last problem) in which children must work within the parenthesis first, to evaluate the expression correctly. ANSWERS: =, >, >, =, <

5 1005

This problem is not directly related to one of the skills of excellence, but it provides you the chance to extend the problem in a direct fashion to the skill of "working backward." Once students understand the basic idea of a "function machine" such as this one--and you could design any type of function machine (adding 4, doubling and then adding 1, etc.), they enjoy finding the output numbers, given the input numbers. But you should also turn the situation around mentally for them, and give them a few output numbers, and ask for the input numbers. In this particular case of the "squaring machine," you might say "Suppose 100 came out of the machine--what number was dropped into the machine?"

ANSWER: 9
49
64

6 1029

Rounding off to the nearest hundred is the essence of this problem. Probably the hardest part here is that the student is asked to round off to a "middle digit," rather than the way they're asked to round off in most textbook situations.

In this problem, unlike many in which they are estimating an answer, they should add the two given numbers, and then round off the answer.

ANSWER: 7400

7 1047
1049
1167

This is a straight computational exercise, but is similar to a flowchart in that the steps are assumed to be followed from left-to-right, in the order given.

ANSWER: 1147

8 1005
1004

This problem is most likely solved either by "working backward" by reversing each step as you go backward from 24 to the left side, or by "guess-check-revise." For "guess-check-revise," the student would simply guess the number to start off the process, and check it out to see if it's correct. If not, they'd revise their guess either up or down, depending on what they learned from their first guess. They'd continue in this fashion till they "narrowed down" the numbers, and found the one to work.

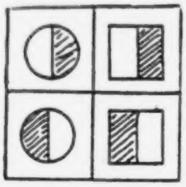
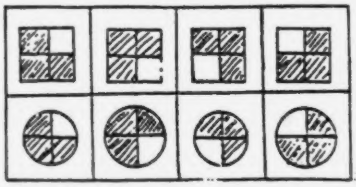
Show the children how this problem is similar to previous ones they've done - IV, #2 and VI, #6.

ANSWER: 7

9	1047	These two problems are thrown in simply as computational challenge problems, for the student who wants to earn some stars. Notice the patterns, for ease of checking! ANSWERS: 739777397773977739777 46394639463946394639

Grade 3 , Worksheet XIV

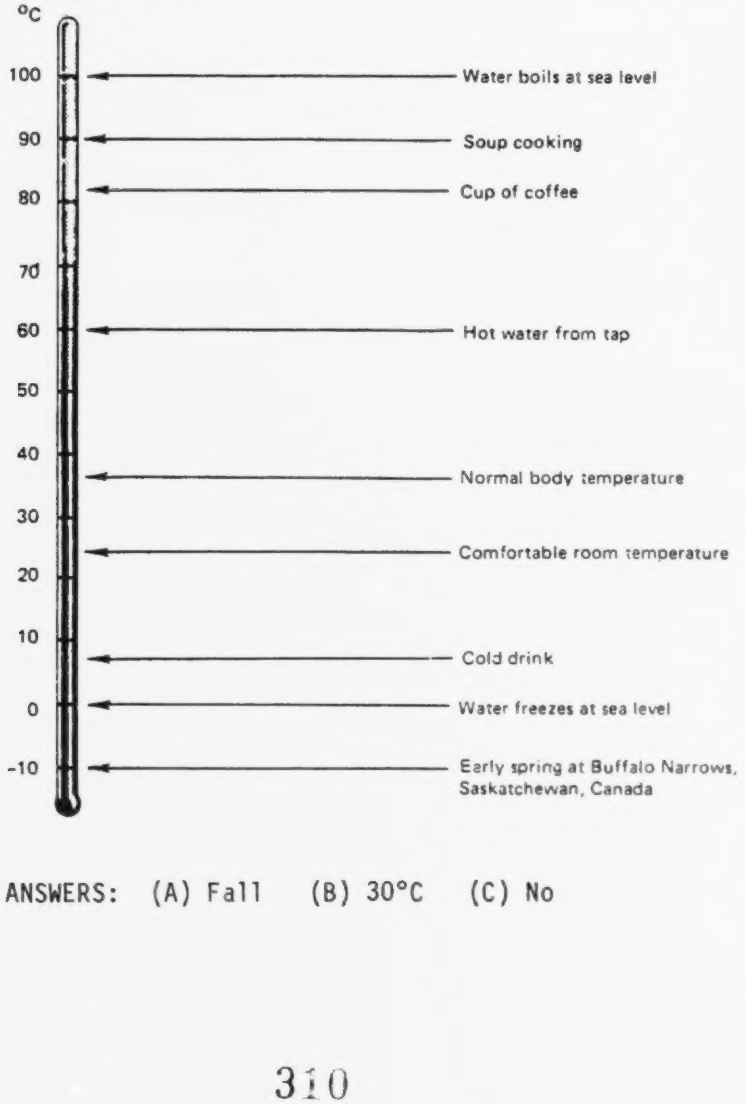
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1155 1156	In your small-group session, have a similar spinner (with different colors than yellow, blue, and green). Review with students that probability means "the chance that an event will occur." Since there are 4 equal-size parts to this spinner, the chance that it will land on any given section is "1 out of 4," which can be written either as 1/4 or 1:4. Then review the chance it will not land on a color, and the chance it will land on a color that takes up 2 of the 4 sections. ANSWER: 1/4 or 1:4 3/4 or 3:4 2/4 or 2:4 (or 1/2 or 1:2)
2	1146	In your small-group session, cover only how to locate the "T" and "S" that are given as hints. However, take a moment to show the usual, ordered pair notation - (1,5) for "T"; (2,5) for "S" - because it will soon be used in later worksheets. ANSWER: HOT DOGS
3	1007 1006	Students will need to use visual discrimination skills to notice the patterning involved in these problems. ANSWERS: (A)  (B) 
4	1007	In this problem the student is asked to recognize a numerical sequence. Three is added to the number just prior to it in this pattern. ANSWER: 1 4 7 10 13 16 19 22

5 1124 1035 Use the thermometers shown in your small-group session, asking different questions from the ones on the worksheet. Be sure students know that the unnumbered marks represent 5° increments. Also be sure to ask a question that requires them to go "below zero" on the scale.

The last question requires that they use personal knowledge of Celsius temperature to answer "real world" questions. It would be helpful if you would permanently post a large picture of a thermometer in the classroom, with some "benchmark temperature" readings they can interpret intuitively. A modified version of this scale could be used:

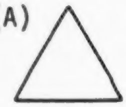
Try to remember these as "check points" for estimating the temperatures of other things in the Celsius scale.


°C
100
90
80
70
60
50
40
30
20
10
0
-10
Water boils at sea level
Soup cooking
Cup of coffee
Hot water from tap
Normal body temperature
Comfortable room temperature
Cold drink
Water freezes at sea level
Early spring at Buffalo Narrows, Saskatchewan, Canada

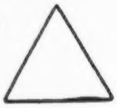
ANSWERS: (A) Fall (B) 30°C (C) No

6 1007 Both of these patterns may be easier to recognize if the student looks at the pattern from right to left.

ANSWERS: (A)



(B)



7 1029 In your small-group session, go over this estimating process several times with different numbers. Give them a practice page with 10 such problems, and the solutions, for them to use at home.

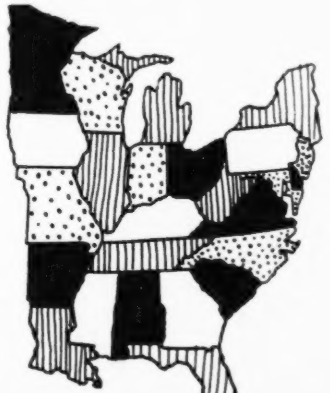
When they turn in their papers, have this problem taped to the desk. Students can't use a pencil; they whisper the answer to the person taking up the papers. If the student says "800," they earn the stars - if not, they don't.

Problem:

$$\begin{array}{r} 213 \\ 478 \\ \underline{+122} \end{array}$$

Grade 3 , Worksheet XV

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1154	Students have previously been introduced, intuitively, to the concept of finding an average (or "mean") in worksheet XII, #1. In your small-group session, return to the "stacking of pennies to get the same height" model--show students concretely how this numerical answer could have been arrived at by adding all 3 numbers, and dividing by 3. Take another example with 4 stacks of pennies - 10¢, 8¢, 12¢, and 6¢. Show that if they add and divide by 4, they'll get the right amount for each stack the same size. Actually construct the 4 stacks to show them. Then talk about this problem - have "1 hour of sunshine" written on 40 index cards - make 5 piles, and then say "how could we make the piles all the same height? How could we find the average without making the piles? (Add and divide by 5.) How could we check our calculated answer?" (Make the 5 piles all the same size, and check.) ANSWER: 8
2	1110	Students probably did this "4-color map problem" in a 2nd grade worksheet, for the Southeastern United States. But they'll enjoy doing it again. In your small-group session, you might encourage them to use a pencil and R, B, etc. (So they can erase and start over, if necessary.) You can show a completed map to the class in the small-group session since it's very unlikely that any two solutions would ever be identical. Call their attention to the "4-corner area" checked below, and the fact that "opposite states" can be the same since they only meet in a point. ANSWER: This is one solution. 

3	1074	Students are still using a geometric figure in an equation, at this point. They can solve the equation easily by "working backwards" mentally (67 - 28 =). In your small-group session, point out the similarity in this problem and problem 5. ANSWER: 39
4	1154	Take a similar problem in class, one in which you have to first line up all the numbers from smallest to largest, and then guess a number that would be greater than half of them, but less than the other half. The concept of "median" is being reinforced in this problem - with certain students, you might have them compare this to the mean (average) of these 6 friends' heights. ANSWER: 46
5	1074	Students again are solving a simple equation, but this is the first case in which a letter of the alphabet is used for the variable, rather than a box, circle, or triangle. Help students realize that this (X) is to be read as a letter, than as "times." ANSWER: 222
6	1110	Have students make simple closed curves and various types of non-simple closed curves with string. ANSWER: Curves A, D, E ,F and H will be colored. Curves B and G are not closed and curve C has two interiors.

Grade 3, Worksheet XVI

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1030	This problem is to reinforce the skill of estimating the solution to money problems. Students should be encouraged to round off the given amount to the closest dollar (e.g., $5.95 to $6) before adding to find the estimate. If they compute an exact answer first, and then round off, they have not estimated at all, but merely computed and rounded off. Use the same problem, but with different dollar amounts, in your small-group. ANSWER: Between $11 and $16
2	1001 1030	Like this problem above, this situation reinforces estimating with money. The first month, the cat will cost about $15, and about $6 for each of the remaining 11 months of the year. The total estimate would then be given by $15 + $66, or $81. Notice that this problem also reinforces the skill of multi-step word problems. In your problem-solving session, extend the problem you do for 1 above to an entire year. ANSWER: Between $80 and $85
3	1006 1127	Students find the volume of this shape, by counting unit blocks. It might be difficult for some students since they have to account for blocks that aren't visible. Encourage them to make such a shape, at home, from sugar cubes. ANSWER: 21
4	1002	This problem is intended to reinforce using a chart as a problem-solving organizer. In your session, do the first 2 problems (32¢ and 26¢) with real coins. ANSWER:

Amount	No. of coins used	Quarter	Dime	Nickel	Penny
32¢	4	1		1	2
26¢	2	1			1
45¢	9			9	
15¢	2		1	1	
19¢	7			3	4
38¢	5	1	1		3
20¢	2		2		

NOTE: Answers may vary.

5	1050	A computational puzzle that requires ingenuity is presented in this situation. The student has to study the subtraction problems and figure out how such answers could be arrived at in a consistent fashion. All teachers will immediately recognize that the student is finding the difference of the "ones digits," rather than borrowing to resolve the impasse. In your small-group session, encourage those who observed what was wrong explain it to the others. ANSWER: 42
6	1108	Students have a chance to demonstrate knowledge of "parallel" and "perpendicular" in this problem. In discussing the problem with them, ask how they can check to see if 2 lines are parallel (measure them at 2 different places, and see if they're the same distance apart at the 2 places). They can check perpendicularity by tearing off the corner of a sheet of paper, and using it as a "right angle tester." ANSWER: There are several correct answers to this problem.
7	1002	Students should list all the letters of the alphabet to start this problem--and then put the money values out beside the letters. This helps make the problem more concrete. They add the money values for each letter in the principal's last name, to get the total value. In your session, have them find the value of someone else's last name. ANSWER: variable. An example would be: "Brown"--72¢ (2¢ + 18 + 15 + 23 + 14)
8	1073	Recognizing odd vs. even numbers is the skill being reinforced in this problem. By the third grade, students should recognize that even numbers always end in 0, 2, 4, 6, or 8, and odd numbers in 1, 3, 5, 7, or 9. Classify the name you used above, in your small-group session. ANSWER: variable, depending on the principal's name. The example above would be "even" since 72¢ is an even number of cents.

9 1022 Students can solve this problem if they're familiar with reading time schedules from a chart. This is a "real world" situation--the television schedule given is from a paper.

ANSWER: (a) 8:30
(b) 1 1/2 hours (10:00 till 11:30)
(c) 2 hours (7:30 till 8:30, and 9:00 till 10:00)

Grade 3, Worksheet XVII

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1010 1125	Hopefully students will actually take a guess on this problem, as directed to, before finding the actual lengths and comparing them. The surprising thing to most people is that, although the height always looks longer than around the top, the reverse is usually true. This problem, if a student goes through this procedure, is an exercise in making a tentative hypothesis, and then checking it out. (And this is one of the few cases in which the original hypothesis will invariably be false.) This problem also involves comparing two lengths in an unusual way--the student might have to use a string to measure around the top, for example. In your small-group session, have a glass for the students to consider. Discuss how they could actually measure it at home, to verify or reject their guess. ANSWER: The acceptable answer would be that it's longer around the top. If a student has a different answer, don't give credit unless the glass is brought in.
2,3	1004 1167 1168	These 2 exercises can probably be solved by "guess-check-revise." Since the problem is to be read left-to-right, and the steps done in that order, the situation is similar to following a flowchart, rather than solving a computational statement with parentheses. The use of a calculator to check the results reinforces skills 1167 and 1168. In your small-group session, check out an example in which the numbers are put in the boxes at random. ANSWERS: 5 + 4 - 7 x 1 ÷ 2 = 1 5 + 4 - 2 x 1 ÷ 7 = 1 (There may be others also.)

4 1020 1001

This problem is a multi-step word problem that involves very careful reading. Since Bob spent 25¢ each afternoon after school, his total savings for the week would be $2 - $1.25, or $0.75. At this rate, students can add $0.75 enough times to produce $8, and count the number of addends. Solve a similar problem, but with different numbers, in class.

ANSWER: 11 weeks

5 1031

This problem gives the student a chance to show that he or she is good at estimating one length, given some other length for comparison. Since BC is shorter than AB, 12 is ruled out as an answer. 7 can also be eliminated since it's pretty obvious that BC is not even half as long as AB. "2 yards" can also be eliminated, but the student might have to take that particular length--perhaps by tracing--and see if it takes 5 of them to be as long as AB.

ANSWER: 4 yards

6 1168

This exercise was included only as a computational challenge. It will probably result in as many different answers as any other problem in this set, because of the tedium involved and chances for mistakes. However, it gives a chance to show the value of a calculator with a tape read-out, for checking, and estimating.

ANSWER: 2494, we think

7 1002

Demonstrate a few steps of the solution to this problem concretely in class, with 2 bowls to represent cages, and cut-outs of the hamsters. Have children see the value of organizing their approach by perhaps first listing all 3 in cage 1, then all 3 in Cage 2, then AB in 1 with C in 2, etc.

ANSWER: 8 ways --

Cage 1	Cage 2
ABC	
	ABC
AB	C
AC	B
BC	A
A	BC
B	AC
C	AB

Grade 3 , Worksheet XVII
(continued)

8 1109 In your small-group session, review how students can test for right, obtuse, or acute angles (worksheet VI, #4). Also be sure they can name an angle using 3 points, with the vertex always listed as the middle point. The symbol " " below is optional.

ANSWERS:
∠ABD or ∠DBA } → (right)
∠FBC or ∠CBF }
∠ABF or ∠FBA } → (acute)
∠FBE or ∠EBF }
∠EBD or ∠DBE }
∠DBC or ∠CBD }
∠ABC or ∠CBA (obtuse)

9 1146 This problem should not be difficult for students, except that "ordered pair" notation is used for the first time (instead of "go East," then "go North"). In your small-group session, cover this notation by picking out various letters on the graph, and having students write their addresses, using ordered pair notation, on scratch paper. Then reverse it - give them a few ordered pairs, and have them tell the letter they find there.

ANSWER: You just won two stars.

Grade 3, Worksheet XVIII

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1022	Ask similar questions in your small-group session, to be sure students can correctly read the graph. ANSWER: Music show 75 minutes (or 1 hr,15 minutes)
2	1004	This is a situation that calls for "guess-check-revise" for 3rd graders. In your small-group session, start by saying, "What are we asked to find - the twin's age! So let's guess what their age might be, and check and see if we are right. If not, we'll change our guess to get closer." Start with a guess of 5. Then write Alice = 5, Andy = 5, so Mom = 24 + 5 = 29. Now is it true that Alice + Andy + Mom = 60? Check it out - if so, we're through, because "5" works. 5 + 5 + 29 = 39. OOPS! Our guess of 5 must not be right. Let's guess again - should we guess higher or lower? Continue for one more guess like this. ANSWER: 12
3	1127 1006	Be sure to use the word "volume" in briefly covering this problem in class. Students can build such a design from sugar cubes if they have trouble visualizing it. ANSWER: 33 blocks
4	1156	Bring a sack to class, and put in several objects that are alike except for color. Ask several probability-type questions, using a verbal response like "the chances are 4 out of 5 that ...," and having the students write "4:5 or 4/5" on scratch paper. Be sure to ask one problem of the "complimentary sort," and have students solve it concretely. ANSWER: 2:3 or 2/3

5 1001 Students will probably use either addition or subtraction to solve this, in one of two ways:

one way: 29 - 11 = 18 yrs. added
18 + 36 = 54 yrs. old

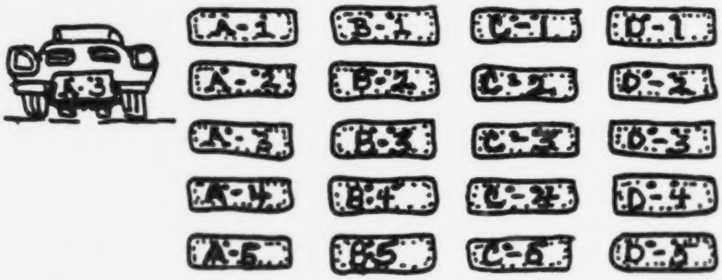
another way: 36 - 11 = 25 yrs. diff. in age
29 + 25 = 54 yrs. old

Note that some might solve it concretely using a number line, and simply counting.

ANSWER: 54 years old

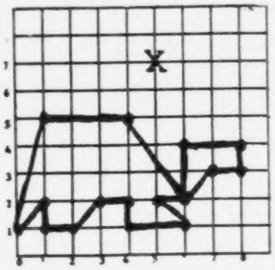
6 1002 Students solve this problem by actually listing the license plates used. Many will notice the pattern that allows an organized list to be made.

ANSWER:



7 1146 You might have to refresh student's memory on ordered pair notation. Take the first few points listed, and find them on the graph, making the connecting line.

ANSWER:

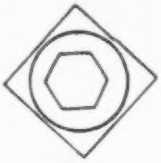


8 1035 This problem involves determining a reasonable answer when working with familiar objects and their length. Be sure that students have some "benchmark" lengths that they're familiar with, to use in such situations. For example, the width of their finger is about 1 cm, their height is a little over 1 meter (100 cm), etc. From such comparisons with familiar objects, they should be able to eliminate the other three choices as unreasonable.

ANSWER: b

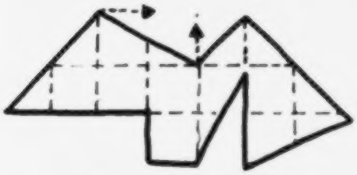
Grade 3, Worksheet XIX

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1050	The only difficult part of this problem is that "borrowing" must be considered in each step. In your small-group session, go over a similar problem. ANSWER: $\begin{array}{r} 9\boxed{6}8\,2 \\ -3\,8\boxed{4}6 \\ \hline 5\,8\,3\,6 \end{array}$
2	1007	In your small-group session, have students describe what they see about the pattern. Some will just notice the single-digit counting pattern, while others might notice things like Column A being the multiples of 3, etc. Take a few numbers other than 22 and 96, and have students tell how they'd find where they would be. [A number like 22 is small enough to be found by counting; 96 was used to force students to look for another method, too.] ANSWER: a. 8 b. B c. A
3	1006 1007	Have students describe briefly what they noticed about the shapes. In this pattern, the outside shape is the previous figure's center shape, and the circle is a constant. ANSWER: 
4	1144	Call students' attention to the "key" at the bottom of the page, and the "half symbol" used in Mr. Smith's class. ANSWER: a. 33 b. 87

5 1036

Ask students how they got their estimate. Some might have marked off the cm^2 grid over the shape, while others might have taken some grid paper and put it under, or on top of, the figure itself. Be sure to show the students how to find the area of partial squares by making rectangles around them, and taking half the area of the rectangle, as in:



The area of A can be found by completing the rectangle, which has area 2, and taking half of that.

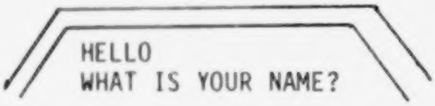
This "making a rectangle," and then taking half the rectangle, is a new concept to these students. But it's a powerful one, and needs to be followed through in regular class work.

ANSWER: 8, 9, 10, 11,or 12 are acceptable answers.

6 1170

Basic knowledge and experience of BASIC computer language will be essential in this problem. The placement of quotation marks in a program dictates what is displayed on the screen (monitor) or printed out on a printer. <u>Only</u> those characters between pairs of quotation marks will appear on a monitor. (Therefore, the correct response will not require the student to answer the question posed in the program.)

ANSWER:

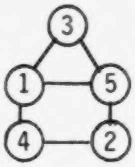


```
HELLO
WHAT IS YOUR NAME?
```

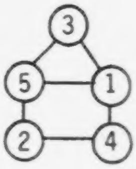
7 1004

Students will likely just "guess and check" if they solve this puzzle correctly.

ANSWER:



or



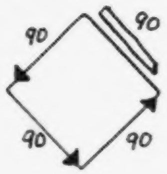
8 1036

This problem gives an opportunity to estimate measurements using metrics. Perimeter is a term the student should be becoming familiar with. (Note: There is an example of a square centimeter on the page. The student may use this to help with the measurement.)

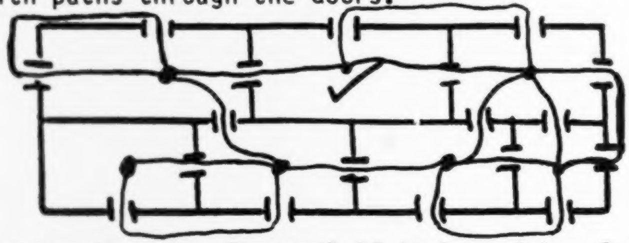
ANSWER: a. Acceptable 7 or 8 cm
b. Acceptable 19, 20, or 21 cm

Grade 3, Worksheet XX

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1001 1168	This is a multi-step word problem that encourages the use of a calculator. Note that it's a mathematical problem that has an answer other than a number. One way of solving the problem is to notice that 9 x 15 is 135, which is more than 125 rabbits, so he'll need rabbit food. Likewise, 2 x 29 is 58, but 58 is less than 75, so he doesn't need dove food. ANSWER: b. rabbit food only
2	1107 1126	This problem shows that various rectangles can have the same area. In your small group session, take a similar problem (like all those with area 20) and go through the procedure. This problem and a previous one (Worksheet VIII, #6) can be used as intuitive introductions to prime vs. composite numbers; "12" and "24" are composite numbers because you can make more than one rectangle - "11" is prime, though, because there's only one rectangle you can make. ANSWER: The three rectangles are a 1 by 12, a 2 by 6, and a 3 by 4.
3	1003	The purpose of this problem is to reinforce the skill on "drawing a diagram" to solve a verbal problem. Therefore, the diagram is a very important part of the answer. It should be a line drawing, and look something like: MY DIAGRAM  ANSWER: Airhead ran 540 feet.

4 1004 1110 This problem is from topology. Students can solve it either by trial and error, or by making a network. Place a dot in each room, and connect all the dots with paths through the doors.



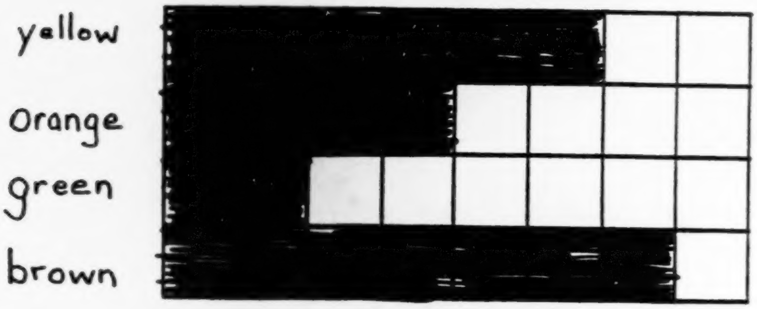
A network can be "traced" if it has either 0 or 2 "odd vertices." This network has 2 odd vertices - the middle top and right top rooms. Therefore, you can start at either of those places to make the path (and you'll wind up at the other odd vertex). If a network has 0 odd vertices, you can trace it by starting anywhere.

ANSWER: The ✓ should be either in the middle top, or right top, rooms.

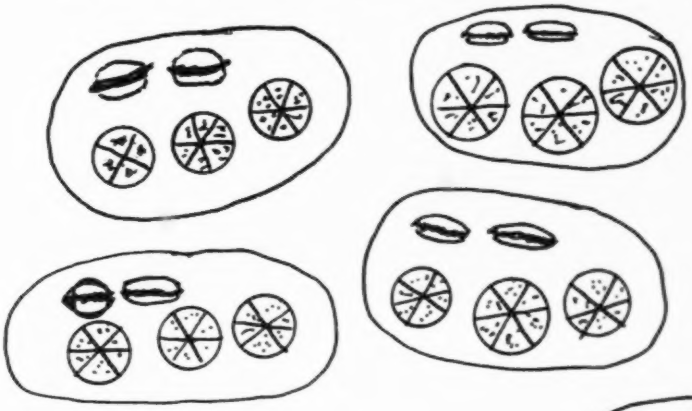
5 1147 1153 This problem allows the student to collect data for an experiment, and fill it in on an appropriate table. There's no way to tell positively that the student actually made all 50 tosses, but assume they did if the table has 50 tally marks in it. In your small-group session, start off the experiment with 10 tosses, and record the data using tally marks. They can finish it at home.

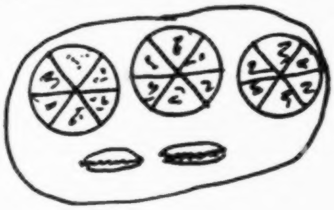
ANSWER: The table correctly filled in is an essential part of the answer--the other part will depend on the results they got, but will almost always be choice (c). If there's an answer other than that, check to see if the answer matches their own data, and if so, give them credit.

6 1145 In your small-group session, make a similar graph for Easter eggs. Notice that, on the given graph, the numbers will go along the horizontal axis while the categories go along the vertical - this may cause some children difficulty.



7 1003 This problem is not specifically related to one of the Standards of Excellence skills, but is certainly within the grasp of children who have a good understanding of the ratio interpretation of a fraction. The fractions should be interpreted as "3 out of 5" and "2 out of 5," and students can then figure the answer by drawing a diagram of sets, as in:



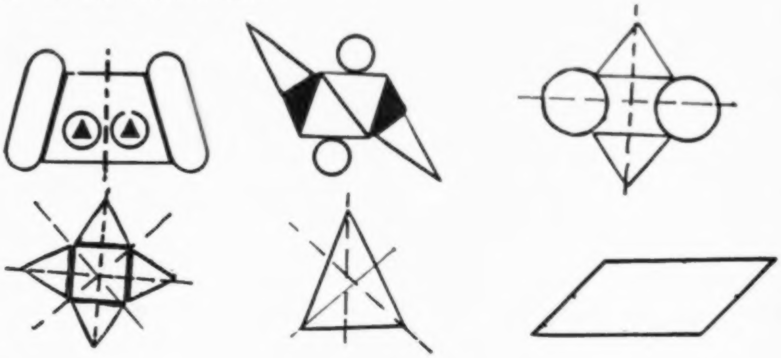
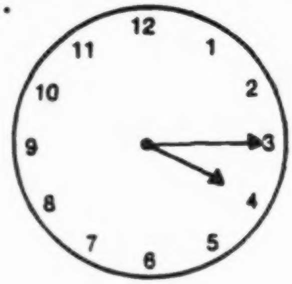


ANSWER: (c)

Grade 3 , Worksheet XXI

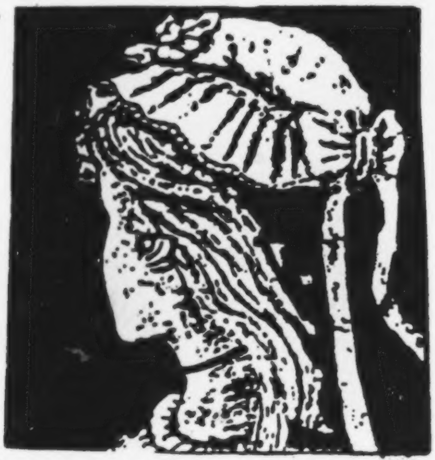
TEACHER COMMENTARY

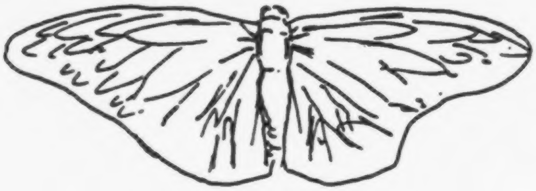
Problem	Skill of Excellence	Comment
1	1006	Students will have to use spatial visualization skills to solve this problem. In your small-group session, you might have a Rubik's cube to show the class and have a student take it apart and show others 1 cube of each type. ANSWERS: 8 12 6
2	1004 1002	Students will likely use "guess-check-revise" to solve this problem. They might start by guessing 10 of each coin, check it to see that 10 dimes and quarters would total $3.50, so revise the guess downward. Some might approach it by listing: 1 dime, 1 quarter = 35¢ 2 dimes, 2 quarters = 70¢ 3 dimes, 3 quarters = $1.05 etc., till they find the amount that yields $2.45. In your small group session, take a similar problem (perhaps pennies and nickels that total 36¢) to solve. ANSWER: 7 dimes and 7 quarters
3	1034	In this problem the student must estimate the solution. Most children will cross out the pies on the worksheet in order to arrive at the answer. ANSWER: b. 4 1/2
4	1046	Remind students that they need to evaluate the two sides of the expression independently before making a comparison. Some will notice that you don't have any computation to do in (c), if they're clever. ANSWER: a. > b. < c. >

5	1074 1004 1005	In attacking this problem, some students will know to subtract 131 from 642 in order to find the answer. Others will probably use the guess and check method. ANSWER: 511
6	1108	In your small-group session, have some pictures that students can fold to find the line of symmetry, or that there is no such line. ANSWER: 
7	1123	Students should not need help with this problem, unless they've learned to tell time exclusively on digital watches. ANSWER: 
8	1054 1168	Be sure you show students, by example, how to work the parentheses first, and then the rest of the expression. Also, be sure that they know which digital numbers are considered to represent which letters of the alphabet - otherwise, a student might have a correct numerical answer, but not be able to translate it into an English word. ANSWER: 35006 - GOOSE

Grade 3, Worksheet XXII

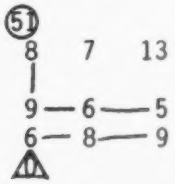
TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1006	Sometimes turning a picture, or looking at an optical illusion at a different angle, helps uncover unusual perspectives. ANSWER: 
2	1018 1001	In your small-group session, cover a problem similar to those given. ANSWERS: a. 27¢ c. 38¢ b. 50¢ d. 12¢
3	1051	Students can shade-in the given pie to see that 2/4 = 1/2. ANSWER: They ate the same amount
4	1123 1005	Students will likely solve this by visually moving the hands backwards on the clock, rather than computing 7:20 - 3:10. In your small-group session, do a problem like "what time was it 1 hour and 5 minutes ago." ANSWER: 4:10

5	1108	"Line of symmetry" is reinforced in this problem. In your small-group session, show students how they might fold the paper to do the tracing, or use another method that involves the line of symmetry. ANSWER: 
6,7	1153 1155 1157	In your small-group session, have 2 students flip coins 12 times and make tally marks on the board for the 2 categories listed. Then select the appropriate answer for problem 7, based on the data just collected. (12 times was selected because they can intuitively figure out 1/4, 1/2, 3/4 of twelve.) Students can then re-do the experiment at home - they should do a larger number of tosses, of course, and you might want to give them numbers of tosses (48, e.g.) that will work out computationally as "12" does. ANSWERS: 6. Check data for 40 tally marks. 7. The answer selected should match the student's data, but if they did the experiment a large number of times, the 2nd response (half of the time) would be correct.

Grade 3 , Worksheet XXIII

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1005 1004	Students can solve this problem either by "working backwards," or by "guess-check-revise." By this time in the school year, you can just mention these 2 approaches in your problem-solving session, and briefly discuss what each would mean for this problem. ANSWER: 7
2	1073	In your small-group session, take 2 similar problems and have students decide whether or not they should be colored. One problem should yield an odd answer, while the other yields an even answer. You might introduce intuitively, language like "in this case, we had an odd number times an odd number, and got an odd answer." ANSWER: Flowers 1, 2, and 4 are colored.
3	1050 1004	Students can solve this by simply guessing where the line should go, and then adjusting the line to give the right answer. Some students might notice that you can "work backwards" by starting at 0 and adding numbers to get 51, rather than starting at 51 and subtracting to get 0. ANSWER: 
4	1109	Students should have no trouble with this problem by this time of the year. ANSWER: X on angles 2, 4, 6

5 1019 Encourage students to use the "count back" method of solving this problem. To do so, you'll have to assume the child gave all $3.00 to the clerk (which he would not really do, because it cost less than $2.00), and the clerk "counted back" his change.

ANSWER: group 3 ($1.35)

6 1124 In your small-group session, consider a similar problem. Be sure that students realize that the marks shown stand for 2° increments, and that the mercury is between 2 marks. They have to be able to read such a temperature before they can even begin the problem.

ANSWER: 32° (47°-15°=32°)

7 1001 In your small-group session, ask "how much would you pay for 50 marbles?" Repeat this for 75 marbles. Students will first have to determine how many bags would be needed to have 150 marbles; they would then have to either use repeated addition or multiplication to answer the question asked.

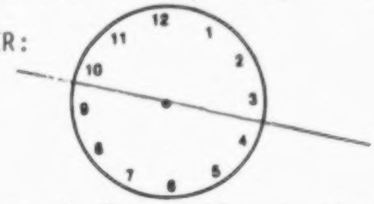
ANSWER: $2.10

8 1050 In your small-group session, either take a similar puzzle and solve it, or show how to do only one step of this puzzle.

ANSWER:

$$\begin{array}{ccccc} 6 & \enclose{circle}{\times} & 6 & = & 36 \\ \enclose{circle}{\div} & & \enclose{circle}{\div} & & \enclose{circle}{\div} \\ 2 & \enclose{circle}{\times} & 3 & = & 6 \\ = & & = & & = \\ 3 & \enclose{circle}{\times} & 2 & = & 6 \end{array}$$

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1107 1108	In your small-group session, do the same problem, but with the digits 0-9. Depending on how you make the digits, you might likely have 1 and 4 circled, and 4 checked also. ANSWER: O'd: A E F H I K L M N T V W X Y Z ✓'d: E F H I L T
2	1009	In your small-group session, you might give the students the hint that there's some unnecessary information in the problem. ANSWER: 2124
3	1003 1007	Suggest to students that they draw the next two sizes of triangles similar to those shown. The 4th one has 5 circles per side, and the 5th has 6. ANSWER: 15, 21
4	1004	Some students will adjust the line that doesn't work, till they get it positioned correctly. Others will simply guess where the line should go, and a few might try some sort of "pairing" of high and low numbers. ANSWER: 
5	1004 1050	Solve a similar problem in the small-group session, showing how they can either simply "guess-check-revise," or modify this approach because of the digits they can see, and their knowledge of fundamental addition facts. Use this problem: $\begin{array}{r} \square\square \\ +\ 7\square \\ \hline 1\square 6 \end{array}$ ANSWER: 9

6 1048 Have the students in your small-group session first identify when they might use this method (when there is "carrying" involved - otherwise it's inappropriate). Also have them practice several in class using either of the given addends to "add a little to." (In the example shown, Tamika might have added 4 to 46 to start with, instead of 2 to 28.)

Be sure to continue this method of mental arithmetic drill throughout the year.

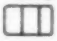
Have this problem taped to the table when children turn in their papers--they can whisper the answer to you for their stars.

38 + 47

ANSWER: 85

Grade 3 , Worksheet XXV

TEACHER COMMENTARY

Problem	Skill of Excellence	Comment
1	1004 1050 1005	In your small-group session, have students solve a similar problem using "guess-check-revise." You can have them each make such a problem themselves to give a friend to solve--in so doing, they should work backwards mentally by writing the whole addition problem and answer, and then covering up any place a particular digit appears. ANSWER: 6
2	1107 1108	Review "parallel" for the students, and perhaps check several letters till you find one that is both circled and checked. ANSWER: E,F,H,I,M,N,Z are checked. Note: "U" doesn't qualify - the bottom is a curve. "W" also, because the lines are almost, but not quite, parallel.
3	1006	This problem is an extension of a problem introduced earlier in the year. You might have them solve the same problem, but for a similar figure (perhaps ) in your small-group session. ANSWER: 15
4,5	1153 1149 1157	Taken together, these problems have the student collect and record data for a probability experiment. The conclusion reached is not one that requires a numerical answer, but in your small-group session you might decide to cover this in addition to the "more likely" notion. You might actually do the problem in your small-group session, only throwing 20 times. Then the students would do it again at home. ANSWER: 4. Check to be sure the number of tally marks is 40. 5. This answer should match the data in problem 4 above.

6	1001 1169	This problem incorporates several skills from standards of excellence, including an intuitive notion of "tax." In your small-group session, it should suffice to point out to students that Charles is thinking of a cone with 2 scoops on it, and he knows about adding tax. Hopefully students will realize that using a calculator doesn't ensure Charles gets a correct answer. ANSWER: The answer is reasonable.
7	1036	Students had a similar problem in worksheet IV, #9. Be sure they realize that "JEXUMS" is an imaginary word, but that each side of the square must be "1 JEXUM." NOTE: The circle is about the size of a dime. Mark off the P and roll the dime. ANSWER: 13 JEXUMS
8	1009	Ask students what $14.99 has to do with the problem itself. ANSWER: 8

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